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ABSTRACT

This publication provides materials developed by a project designed to transfer a U.S. Army computer-based basic skills curriculum to applications in the vocational skills development of civilian adults. An executive summary of the final report describes the Job Skills Education Program (JSEP), which teaches academic skills that support vocational training. A technical report describes the range of activities in developing JSEP for use in a civilian environment and demonstrating its effectiveness. A lesson-by-lesson description of the curriculum, which addresses 167 skills, is provided. Contents are further divided into separate volumes. Volumes I and II chronicle individual tasks from the project. Volume III provides an overview of the project procedures and outcomes. These volumes describe the military-to-civilian conversion project. Volume IV is the JSEP Implementation Handbook. It describes the JSEP instructor's roles and responsibilities, JSEP lessons, software and hardware for MicroTICCIT--the computer system on which the civilian version of JSEP runs, courseware operations, and evaluation methods. Extensive appendixes provide prescriptions for 20 occupations, civilian job equivalents for military jobs, sample reports from the student management system, and a glossary. Volume V is a detailed report of the project pilot test conducted in White Plains, New York. Volume VI provides information regarding the availability of JSEP and the hardware and personnel training required for implementation. (YLB)

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ED326741

FINAL TECHNICAL REPORT

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JOB SKILLS EDUCATION PROGRAM

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TITLE: Using the Job Skills Education Program
to Prepare Adults for Vocational or
Job Specific Training Programs

CONTRACT NUMBER: VN88003501

EXPIRATION DATE: April 30, 1990

CONTRACTOR: Florida State University
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PRINCIPAL INVESTIGATOR: Robert K. Branson

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The Job Skills Education Program
April 30, 1990

Submitted to:

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Abstract-Final Technical Report

Abstract

The Job Skills Education Program

The Job Skills Education Program prepares adults for vocational and job-specific training programs. Created by the team of Florida State University's (FSU) Center for Educational Technology and Ford Aerospace Corporation, the project was sponsored by the U.S. Department of Education's Office of Vocational and Adult Education, in collaboration with the Departments of Defense and Labor. The focus of this project was to transfer a U.S. Army computer-based basic skills curriculum developed by FSU and Ford to applications in the vocational skills development of civilian adults.

The Army Job Skills Education Program (JSEP) is a computer-based instructional system designed to improve soldiers' abilities to learn their military jobs and to boost the career potential of enlisted personnel. The Army JSEP curriculum consists of more than 300 lessons addressing more than 191 general academic skills identified by an extensive analysis of 94 Army jobs. The Army curriculum is currently hosted on Ford Aerospace Corporation's MicroTICCIT computer system and Control Date Corporation's PLATO computer system.

A civilian version of the curriculum, addressing 167 skills, was adapted from the Army version, and is detailed in this report. The pilot offering of the civilian version of JSEP was successfully conducted with learners at the Rochambeau School in White Plains, New York. The pilot project acomplished three primary goals. It assessed the effectiveness of JSEP with civilian learners, a different audience from the Army personnel for whom the program was initially developed. The project also determined the type and amount of adaptation that would be required for JSEP to work well in typical civilian settings. Finally, the project supported materials that will aid the implementation and diffusion of JSEP at the state and local levels.

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Executive Summary-Final Technical Report

JOB SKILLS EDUCATION PROGRAM FINAL REPORT

EXECUTIVE SUMMARY

The U.S. Department of Education contract number VN880003501, "Using the Job Skills Education Program to Prepare Adults for Vocational or Job-Specific Training Programs", was devised to determine if adults in vocational adult basic skills training programs and environments could use and benefit from the Job Skills Education Program (JSEP) developed by the U.S. Army. A second purpose was to make a general determination about the process and feasibility of transferring military instruction to civilian use. Restated, the issues of interest were the degree of appropriateness of the curriculum for a civilian audience, and the nature and level of effort required to render the program viable with the new audience. In brief, the contract called for the contractor to examine and adapt the computer based instructional material, select a pilot test site, and determine the effectiveness of the materials.

The contract was awarded to the Florida State University Center for Educational Technology (FSU), and its subcontractor and teaming partner Ford Aerospace Corporation (Ford). FSU and Ford were the creators of the original JSEP program for the U.S. Army, and were able to assign many of the original designers, programmers, and technical staff to the new version of the curriculum.

What is JSEP?

JSEP is a computer-based curriculum of job-related lessons designed to teach academic skills that support vocational training. The curriculum contains 167 lesson titles addressing basic quantitative and verbal skills, and supplemented by a series of five Learner Strategy modules that teach learners how to learn. Twenty five of the lessons are paper-based, and the other 142 are computer-based. The lessons are controlled by the computerized Student Management System (SMS) which tracks individual student progress and generates program reports. Students have individualized prescriptions of lessons tailored to the vocational area of their interest and their particular level of entry skills. The program is designed to operate on an open-entry, open-exit basis to accommodate the often mercurial nature of adult student's schedules.

The civilian version of JSEP operates on the MicroTICCIT computer system, typically networking a host and 338 megabyte hard disk with individual student workstations. The stations are equipped with a MicroTICCIT keyboard and peripheral light pen. The host is equipped with a printer. The host and workstations are IBM or compatible microcomputers running MicroTICCIT software in MS DOS.

Creating a "Civilian" JSEP

The original version of JSEP has been successfully demonstrated at several Army sites and on two delivery systems, Ford's MicroTICCIT system and Control Data's PLATO system. The U.S. Departments of Education and Labor recognized a similarity between the enlisted personnel benefiting from JSEP and many of the clients served in various civilian basic skills, job training and vocational education programs, and initiated the adaptation and pilot efforts presented here.

A literature review of other military training materials made available to the public was conducted, along with interviews with representatives of various vocational education organizations. This activity led to the formation of guidelines for adapting the military curriculum for the civilian target audience.

After determining that approximately 90 percent of the curriculum could be converted to civilian use, and that the SMS and testing instruments could be adapted as well, the redesign and conversion effort began. Lessons and tests were reviewed, redesigned, and reprogrammed with new, "degreened" examples and graphics, and the overall readability level was simplified. The JSEP Common Test, a comprehensive objective-referenced exam used for pre- and posttesting, was revised and shortened as well.

Twenty new prescriptions were created using job titles from the Dictionary of Occupational Titles. All were selected with regard to growth rates and representativeness of genders and regions. These vocational tracks were programmed into the SMS, and JSEP Instructors were provided with a technique for creating custom prescriptions to reflect local concerns.

Conducting a Pilot Test

The White Plains, New York Adult and Continuing Education Center (Rochambeau School) was selected as the pilot test site on the basis of its heterogeneous audience of adult students, effective faculty and administration, and the strong interest of the New York Education

Department. Rochambeau School provided an audience of Adult Basic Education (ABE), high-school Graduate Equivalency Diploma (GED), and English as a Second Language (ESL) students. The MicroTICCIT hardware was installed at the school and four Instructors were trained to use JSEP.

The pilot test lasted for six months. Data collection involved the use of a 65-item comprehensive pretest and posttest, individual lesson posttests, pre- and post- administrations of the Test of Adult Basic Education (TABE), pre- and post-JSEP administrations of student questionnaires, and lesson reaction questionnaires, plus the anecdotal observations of the instructors.

The students completed an average of 40.5 lessons in 78.8 hours. They averaged a gain of 34% on the objective-referenced exam from pretest to posttest. The effect size of the improvement was .97 standard deviation. (Effect Size = [Posttest mean - Pretest mean]/Pretest Standard Deviation.)

The average gain on the TABE (the ESL students did not take the TABE) was 1.26 grades for reading and .94 grade for math, with effect sizes of .68 and .50 standard deviation, respectively.

The student responses to the questionnaires were very positive. Students reported that they could read the materials and understood the lesson objectives. Most of the respondents said that the lessons were at an appropriate level of difficulty. Most of the students were satisfied with JSEP, and very few indicated that they got tired or bored with the instruction.

Overall, student performance on the tests was extremely good, and student attitudes were very positive, leading to the following conclusions:

1) The students understood what they were supposed to do in the lessons;
2) The students could read the materials;
3) The lesson content was at about the right level of difficulty;
4) The presence of objects, processes, and references related to the military did not seem to affect student performance adversely;
5) Students perceived the opportunity to use a computer as a positive and valuable part of JSEP instruction.

The results from the student performance on the individual lesson posttests, the JSEP Common Test, and the TABE indicate that the civilian adults were able to succeed in and learn from the JSEP curriculum. Each of the three main subgroups posted very impressive gains and evidenced continued enthusiasm for studying in the program.

Published Project Documents

Two of the documents created under the project have been printed by the Government Printing Office and delivered to the U.S. Department of Education, Office of Vocational and Adult Education. The first is a brochure describing the JSEP, with an address to write to for more information. The second is the JSEP Implementation Handbook, a comprehensive guide to using the program. This book has been used as a training manual for JSEP instructors.

The Final Report

In addition to this summary, the final report contains a one page abstract and a description of the individual tasks conducted under the contract; an explanation of how the project was conducted and how the results may be used; copies of the brochure and Implementation Manual; a detailed pilot test report; and a dissemination plan with system configurations, sources and costs.

Curriculum Catalog

The following catalog contains a lesson-by-lesson description of the curriculum. Lessons that have been "striked" out are military lessons that have been removed from the civilian version of JSEP.

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Preface

The Job Skills Education Program (JSEP) represents the efforts of several organizations and many individuals to provide academic tools to persons most in need of them: the unemployed, the underemployed, and the economically disenfranchised in our society. To this end the Federal Departments of Education, Labor, and Defense, together with The Florida State University, Ford Aerospace Corporation, and The Rochambeau School at White Plains, NY created a framework and provided the resources to test the feasibility of transferring a computer-based, educational technology created for one audience—soldiers in the U.S. Army—to members of another group—civilians in a vocational education or adult education program. The underlying rationale was that if this were possible, other educational technologies created under similar circumstances might also be adaptable, thus effectively doubling the effect of training dollars. The trials undergone and the lessons learned during the JSEP project show that this rationale was correct. That this proved to be so is large testimony but insufficient thanks to all those who have contributed to the project materially and intellectually.

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Final Report
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Introduction

The Job Skills Education Program (JSEP) is a civilian adaption of a large-scale, computer-based education program. The Florida State University (FSU) and Ford Aerospace (Ford) originally developed JSEP for soldiers in the U.S. Army who needed instruction in basic academic skills in order to learn their jobs. JSEP was also a response to training demands created by introducing new technologies into the military workplace. Consequently, JSEP's primary goal--at both military and civilian levels--is to provide the education that is required to become competent at a wide range of jobs.

JSEP uses innovative approaches to help learners master instructional objectives and goals more effectively and efficiently than with conventional instruction. This is accomplished by combining instruction based on contemporary learning theory with the superior delivery capabilities of the computer. In this learning environment students can master prerequisite job skills they have not been able to acquire in the past. Furthermore, learning is self-paced and is designed to provide enhanced motivation to learn through generous use of color, graphics, and action-oriented scenarios.

Curriculum courseware and the Student Management System operate on Ford's MicroTICCIT computer system. The computer-based Student Management System provides student diagnosis, learner prescriptions, on-line help screens, individual student tracking, and student reports. JSEP also allows administrative and instructional flexibility with open entry and open exit.

JSEP is unique among training systems; it is built on a detailed front-end analysis of academic skills that relate directly to job performance. At the military level, this analysis covered soldiers' tasks in the 94 highest density military occupational specialties (MOS). Translating these same MOSs to their civilian equivalents produced 125 occupations. Finally, of these 125 civilian occupational titles, 20 were chosen for the JSEP pilot test, based on a match with vocational course titles at the pilot test site.

The civilian version of the JSEP curriculum contains instruction on 167 basic academic skills, with individual lessons adapted from the Army version.

The Technical Report describes the range of activities in developing JSEP for use in a civilian environment and demonstrating its effectiveness. The various documents discuss and illustrate all aspects of the project including curriculum development procedures, implementation procedures, pilot test results, and final dissemination.

The contents of this report are divided into separate volumes that may be removed and used individually as per local needs. Volumes I and II chronicle individual tasks from the project. Volume III provides an overview of the project procedures and outcomes. These volumes are intended to describe the military-to-civilian conversion project rather than the resultant civilian JSEP curriculum. (Volume I represents a report submitted to the government earlier in the project and has not been amended here.)

Volume IV is the JSEP Implementation Handbook, published separately by the Government Printing Office. This volume is highly descriptive of the JSEP curriculum as adapted to civilian use.

Volume V is a detailed report of the project pilot test conducted in White Plains, New York.

Volume VI provides information regarding the availability of JSEP and the hardware and personnel training required for implementation.

The following pages contain a lesson-by-lesson description of the curriculum. Lessons that have been "striked" out are military lessons that have been removed from the civilian version of JSEP.

Series: Numbering and Counting

PC#	Title	Topic
01A	Match Numbers with Word Names and Models	1. Match numerals with word names. 2. Match decimals with word names. 3. Count forward using decimals. 4. Match models of amount with word names and numerals. 5. Match alphanumeric codes.
01B	Write Numbers in Sequence	1. Write numerals in sequence from any starting point. 2. Order numeric codes. 3. Count alphanumeric codes. 4. Copy alphanumeric codes from equipment forms, manuals, and supplies.
01C	Order Numbers in a Specific Sequence	1. Sequence positive whole numbers. 2. Sequence positive numbers with decimals. 3. Sequence negative whole numbers. 4. Sequence negative numbers with decimals. 5. Interpret +/- (plus or minus).

Series: Numbering and Counting

PC#	Title	Topic
01D	Identify the Greatest or Least Number from a Set of Numbers	1. Select the greatest / least number from a given set of: 2. Whole numbers. 3. Decimal numbers. 4. Mixed decimal numbers. 5. Fractions. 6. Mixed numbers with fractions.
01E	Identify an Object with a Specified Ordinal Position	1. Match ordinal words with ordinal numbers. 2. Match ordinal word name with ordinal position. 3. Use "er", "est", word with position (e.g., highest, lowest, bigger, biggest). 4. Order items in ordinal positions. 5. Identify an object with a specified ordinal position.
01F	Write or State the Place Value of a Particular Digit in a Whole or Decimal Number	1. Place values of any whole number (up to eight digits). 2. Place values of any digit in a 4-digit decimal. 3. Place values of any digit in a whole or decimal number.

Series: Numbering and Counting

PC#	Title	Topic
01G	Rounding Numbers	1. What is rounding? 2. Round whole numbers to specified place values. 3. Round whole numbers to the nearest 5. 4. Round whole numbers to the nearest 25. 5. Round whole numbers to the nearest 50. 6. Round decimal numbers. 7. Round in special situations.
01H	Count Forward or Backward by a Given Number and Determine the Next Number in a Series	This lesson reviews counting backward and forward by a given number and how to determine the next number in a series.
01I	Match Positive and Negative Numbers or Points with Tick Marks on a Number Line	This lesson reviews matching positive and negative numbers or points with tick marks on a number line.

Series: Linear, Weight, and Volume Measures

PC#	Title	Topic
02A	Interpret the Markings on Linear Scales	1. Locate marks on a scale. 2. Locate the zero value on the scale. 3. Determine the value of the intervals on the scale.
02B	Identify Units of Measure and Classify According to Type of Measure	1. U.S. and Metric measures of length. 2. U.S. and Metric measures of weight. 3. U.S. and Metric measures of liquid volume. 4. U.S. and Metric measures of speed.
02C	Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks	1. Rulers, yardsticks, and metersticks. 2. Interpret scales. 3. Locate the zero or start value on the scale. 4. Line up and read the scale.
02D	Identify Measures of Weight, Pressure, and Torque	How to measure weight, torque, and pressure.
02E	Identify Measures of Volume and Capacity	Use Metric and U.S. standard units of measurement for volume and capacity.

Series: Linear, Weight, and Volume Measures

PC#	Title	Topic
02F	Measure with a Non-Numerical Calibrated Scale	Use dipsticks and bubble levels.
02G	Estimate Lengths and Distances	1. Flash-to-Bang method. 2. Pace count method. 3. Football field method. 4. Compare known lengths to unknown lengths.

Series: Time-Telling Measures

PC#	Title	Topic
03A	Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature	1. Degrees and mils. 2. Measure direction. 3. Mils and distance. 4. Degrees and temperature.
03B	Estimate the Measure of an Angle not Greater than 180 Degrees	1. Common angles. 2. Greater and lesser angles. 3. Angles in various orders and rotation. 4. Clockwise and counter-clockwise angles. 5. Use angular measurement with equipment.
~~03C~~	~~Interpret Azimuths and Grid-Magnetic Angles Using Mils~~	~~1. Background information and baseline symbols.~~ ~~2. Azimuths and back azimuths.~~ ~~3. Classify azimuths and define G-M angles.~~ ~~4. Convert G-M angles.~~
~~03D~~	~~Interpret Azimuths and Grid-Magnetic Angles Using Degrees~~	~~1. Background information and baseline symbols.~~ ~~2. Azimuths and back azimuths.~~ ~~3. Classifying azimuths and defining G-M angles.~~ ~~4. G-M angles.~~ ~~5. Convert G-M angles.~~

Series: Time-Telling Measures

PC#	Title	Topic
04A	Interpret 24-Hour Time	1. How to read 24-hour time. 2. Convert from 12-hour to 24-hour time. 3. Recognize analog clocks. 4. Convert from 24-hour time to 12-hour time.
04B	Use the Position of the Clock to Indicate Direction.	1. How to relate clocks to direction. 2. Direction in relation to your position. 3. 12 o'clock and other directions.
04C	Estimate Time in Seconds and Minutes	1. Estimate seconds. 2. Estimate minutes.
~~04D~~	~~Use Julian and Common Calendars to Convert Common Dates to Julian Dates~~	~~1. Types of common dates.~~ ~~2. Days of the month.~~ ~~3. Leap year: A special case.~~ ~~4. Julian dates.~~ ~~5. Convert common dates to Julian dates.~~ ~~6. Convert Julian dates to common dates.~~

Series: Time-Telling Measures

PC#	Title	Topic
04E	Express Time Using Decimals	How to convert time from hours and minutes to hours and tenths of hours using decimal notation.
~~04F~~	~~Compute Zulu Time~~	~~1. Civilian and 24-hour time.~~ ~~2. Zulu time.~~

Series: Gauge Measures

PC#	Title	Topic
05A	Read and Interpret Gauges	1. The feeler gauge. 2. The thread gauge. 3. The ruler. 4. The caliper. 5. The meter. 6. The micrometer.
05B	Using Gauges with Digital Readouts	1. Terms and abbreviations. 2. Locate a labeled gauge. 3. Locate an unlabeled gauge. 4. Read a digital readout.
05C	Read a Color Band Gauge	1. Give meaning to the color. 2. Interpret gauges with color divisions.
05D	Read and Interpret Scales with Positive and Negative Markings	1. Find zero. 2. Determine positive or negative. 3. Read the numbered values. 4. Read the tick marked values.

Series: Gauge Measures

PC#	Title	Topic
05E	Read and Interpret Multi-Scale Gauges	1. Select the correct scale. 2. Read the scale. 3. Select the correct range.
05F	Match a Gauge Reading to a Specification	1. Find the reading in the specification. 2. Read the gauge. 3. Compare the reading and the specification. 4. Choose a course of action.
05G	Read and Interpret Unnumbered Gauges	1. Identify gauge indicators. 2. Relate indicators to markings on gauge. 3. Determine the meaning of indicator positions.
05H	Read a Moving Gauge	1. Identify minimum and maximum values (out-of-range). 2. Identify middle values (within range). 3. Read a gauge that is momentarily sustained.

Gauge Measures

PC#	Title	Topic
05I	Adjust Gauges to Meet Specifications	1. Numbered gauges. 2. Unnumbered gauges. 3. Gauges with positive and negative numbers. 4. Multimeter gauges. 5. Digital gauges. 6. Match gauge readings to specifications. 7. Adjust gauges.

Series: Spatial

PC#	Title	Topic
06A	Identify Directions that Tools, Hardware, or Components may be Moved	1. Forward vs. backward. 2. Toward vs. away. 3. Left vs. right. 4. Horizontal vs vertical. 5. In vs. out. 6. Up vs. down. 7. Clockwise vs. counter-clockwise.
06B	Align Parts and Equipment	1. Align one part of an object with another. 2. Make two objects parallel. 3. Make two objects perpendicular. 4. Place two objects at an angle.
06C	Interpret Spatial Relations	1. Directional words. 2. Distance words. 3. Two steps to use spatial words.
06D	Relate Symbols to What they Represent	How to relate symbols and graphic representations to actual systems, subsystems, and components.

Series: Lines

PC#	Title	Topic
07A	Identify Points, Lines, Line Segments, and Rays	1. Definitions of points, lines, line segments, and rays. 2. Identify points, lines line segments, and rays.
07B	Identify Parallel, Intersecting, and Other Lines	1. What are horizontal, vertical, and diagonal lines? 2. How to draw horizontal, vertical, and diagonal lines. 3. Parallel and intersecting lines. 4. Drawing parallel and intersecting lines.
07C	Identify Perpendicular and Intersecting Lines	1. Background information. 2. Intersecting lines. 3. Perpendicular lines. 3. Practice drawing perpendicular and non-perpendicular lines.
07D	Superimpose Lines	Reviews how to superimpose lines.
07E	Draw Lines	Reviews how to draw lines.

Series: Planes

PC#	Title	Topic
08A	Identify Geometric Shapes	1. Names of polygons. 2. 4-sided shapes. 3. Shapes with a curved line. 4. Common shapes.
08B	Identify Characteristics of Plane Shapes	Names of parts of common plane shapes.
08C	Use Descriptions to Identify Objects	1. Number of features. 2. Dimensions and their measures. 3. Location and/or parts.
08D	Match Figures of Both Actual Size and Model Drawings	1. Match pictures of figures. 2. Match model drawing to actual figures.
08E	Identify Objects Based On Position	Identify objects based on their positions.

Series: Angles and Triangles

PC#	Title	Topic
09A	Identify Angles	1. Identify parts and names of angles. 2. Identify 45, 90, or 180 degree angles. 3. Identify 60, 135, 225, and 270 degree angles.
09B	Identify Types of Angles	Review vertical, horizontal, complimentary, and supplementary angles.
09C	Identify Types of Triangles	1. The triangle and its parts. 2. Identify right triangles. 3. Identify isosceles triangles. 4. Identify equilateral triangles. 5. Identify congruent and similar triangles.
09D	Draw Bisectors of Angles and Altitudes of Triangles	1. Identify and draw angle bisectors. 2. Identify and draw triangle altitudes.
09E	Label Angles	Label angles with numbers and letters.

Series: Solids

PC#	Title	Topic
10A	Recognize Solid Shapes and Match Solid Figure Shapes to Their Names	1. Cylinders (cylindrical shapes). 2. Cones (conical shapes). 3. Cubes. 4. Spheres (ball-shape solids). 5. Pyramids. 6. Tetrahedons. 7. Rectangular solids or boxes. 8. Domes rectangular solids. 9. U-shapes.

Series: Terminology

PC#	Title	Topic
11A	Identify Shape and Position Terms	Identify shape and position terms. Some of them apply to both shapes and positions.
11B	Identify Spatial Orientation Terms with Positions	Practice using position and movement terms.

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Series: Addition and Subtraction

PC#	Title	Topic
12A	Add and Subtract Whole Numbers without Carrying or Borrowing	1. Add single digit whole numbers.
		2. Add multidigit whole numbers.
		3. Subtract single digit whole numbers.
		4. Subtract multidigit whole numbers.
12B	Add and Subtract Whole Numbers with Carrying or Borrowing	1. Introduction.
		2. Review.
		3. Add with carrying.
		4. Subtract with borrowing.
12C	Add and Subtract Decimals	1. Introduction.
		2. Add decimals without carrying.
		3. Add decimals with carrying.
		4. Subtract decimals without borrowing.
		5. Subtract decimals with borrowing.
12D	Add and Subtract Positive and Negative Numbers	1. Signed numbers and the number line.
		2. Add numbers with the same sign.
		3. Add numbers with different signs.
		4. Subtract signed numbers.

Series: Addition and Subtraction

PC#	Title	Topic
12E	Add or Subtract Military Time	1. Convert civilian time to military time. 2. Add military time. 3. Subtract military time. 4. Add and subtract using seconds.
12F	Increase and Decrease Values on Measuring Instruments	1. Increase values on gauges. 2. Decrease values on gauges. 3. Determine the difference between two readings.
12G	Add and Subtract Measurements	1. Review of linear, dry, liquid, and degree measurements. 2. Addition of measurements. 3. Subtraction of measurements.
12H	Estimate a Sum or Difference	1. Review of place values. 2. Round numbers. 3. Estimate the sum. 4. Estimate the difference. 5. Choose the level of estimation.

Series: Multiplication and Division

PC#	Title	Topic
13A	Multiply and Divide Whole Numbers	1. Multiplication Tables . 2. Level Two: Multiplication and Division. 3. Level Three: Multiplication and Division.
13B	Multiply and Divide Decimal Numbers	1. Review of multiplication and division. 2. Review of decimals. 3. Multiply numbers with decimals. 4. Divide numbers with decimals.
13C	Divide Numbers with Decimals	1. Review of division with decimals. 2. Divide decimal numbers by whole numbers. 3. Divide whole numbers by decimal numbers. 4. Divide decimal numbers by decimal numbers

Series: Multiplication and Division

PC#	Title	Topic
13D	Multiply and Divide Negative and Positive Numbers	1. Review of multiplication and division.
		2. Review of positive and negative numbers.
		3. Multiplication of positive and negative numbers.
		4. Division of positive and negative numbers.
13E	Estimate a Product or Quotient	1. Review place values and rounding numbers.
		2. Estimate products (multiplication).
		3. Estimate quotients (division).

Series: Fractions/Decimals

PC#	Title	Topic
14A	Estimate Fractional Length, Area, Volume, and Distance	1. Review of fractions. 2. Review of estimation. 3. Estimate fractional length, area, volume, and distance.
14B	Reduce Fractions to Lowest Terms	1. Reduce proper fractions. 2. Reduce improper fractions. 3. Reduce mixed numbers with proper fractions. 4. Reduce mixed Tractions with improper fractions.
14C	Use a Conversion Table to Convert Decimals and Fractions	1. Introduction 2. Convert proper fractions to decimals. 3. Convert improper fractions to decimals. 4. Convert decimals to proper fractions.
14D	Convert Decimals, Percents, and Fractions	1. Comparing fractions, decimals, and percents. 2. Convert decimals into fractions. 3. Convert fractions into decimals. 4. Percents and fractions.

Series: Fractions/Decimals

PC#	Title	Topic
14E	Add and Subtract Fractions	1. Review of fractions/ lowest common denominator. 2. Add fractions with the same denominator. 3. Add fractions with different denominators. 4. Subtract fractions with the same denominator. 5. Subtract fractions with different denominators.
14F	Multiply and Divide Fractions	1. Introduction. 2. Reduce a fraction. 3. Multiply fractions. 4. Mixed numbers. 5. Divide fractions. 6. Divide fractions by whole numbers. 7. Divide fractions with mixed numbers.
14G	Estimate Fractional Parts Using Common Fractions	1. Common fractions. 2. Basic arithmetic for estimation. 3. Estimate a part using addition or subtraction. 4. Estimate a part using multiplication or division.

Series: Geometry

PC#	Title	Topic
15A	Draw Plane Geometric Figures	Review how to draw plane geometric figures.
15B	Match Geometric Figures with their Word Names	1. Identify plane shapes. 2. Identify solid shapes. 3. Identify relationships and terms.
15C	Identify Parts of Geometric Figures	Review the parts of some geometric figures.
~~15D~~	~~Use a Protractor~~	~~1. Read a scale.~~ ~~2. Measure an angle.~~ ~~3. Measure an azimuth.~~ ~~4. Plot an azimuth.~~
~~15E~~	~~Construct Perpendicular Lines Using a Protractor~~	~~1. Identify perpendicular lines.~~ ~~2. Identify protractor parts and functions.~~ ~~3. Use the protractor to construct perpendicular lines.~~
15F	Compute Area and Perimeter of a Rectangle	1. What is a rectangle? 2. Length and width. 3. The area of a rectangle. 4. The perimeter of a rectangle.

Series: Geometry

PC#	Title	Topic
15G	Compute the Area and Circumference of a Circle	1. Circles. 2. Compute the circumference of a circle. 3. Compute the area of a circle.
15H	Compute the Area and Volume of Rectangular Solids	1. What is a rectangular solid? 2. Compute volume of rectangular solids. 3. Compute the surface area of rectangular solids.
15I	Use Formulas to Solve Problems Involving Geometric Figures	1. The area of a rectangle. 2. The surface area of a 3-dimensional rectangular object. 3. The volume of a rectangular solid. 4. The circumference of a circle. 5. The area of a circle.

Series: Geometry

PC#	Title	Topic
15J	Read Voltage, Voltage Difference, and Time Duration from an Oscilloscope	1. Introduction to the oscilloscope. 2. Read voltage from an oscilloscope. 3. Read voltage difference from an oscilloscope. 4. Read time duration from an oscilloscope.

Series: Combination of Processes

PC#	Title	Topic
~~16A~~	~~Estimate the Center of an Object~~	~~Find or estimate the center of an object.~~
16B	Compute Averages	1. Compute averages. 2. Count. 3. Find the averages. 4. Compute the average of measurement with different units.
16C	Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions	1. Operations within parentheses. 2. Order of different operations. 3. Processes with whole numbers and decimal numbers. 4. Processes with whole numbers and fractional numbers. 5. Processes with whole numbers, decimal numbers, and fractional numbers.

Series: Combination of Processes

PC#	Title	Topic
16D	Solve Problems Using Units of Measurement	1. Abbreviations of units of measurement.
		2. Add and subtract using units of measurement.
		3. Multiply using units of measurement.
		4. Divide using units of measurement.
		5. Multiply and divide using units of measurement.
		6. Relationships among some units of measurement.
16E	Get Information from Number Lines, Graphs, Tables, and Scales	1. Number lines.
		2. Graphs.
		3. Tables.
		4. Bar scales.
16F	Solve Conversion Problems	1. Solve conversion problems using conversion factors.
		2. Convert units of temperature using conversion factors.
		3. Summary.
16G	Solve Problems Involving Ratio and Proportion	1. Ratios.
		2. Use the product rule to solve for unknowns in proportions.
		3. Solve for unknowns in word problems using proportions.

Series: Combination of Processes

PC#	Title	Topic
16H	Use Word Problems	1. Identify unknowns.
		2. Identify knowns.
		3. Select the formula.
		4. Do the calculations.

Series: Graphing in the Coordinate Plane

PC#	Title	Topic
~~17A~~	~~Read and Write Grid Coordinates on the Military Map~~	~~1. Grid lines.~~ ~~2. Grid squares.~~ ~~3. Points inside grid squares.~~ ~~4. Use six-digit coordinates.~~ ~~5. Write six-digit coordinates.~~
~~17B~~	~~Locate Intersections on a Military Map~~	~~Locate six-digit grid coordinates.~~
~~17C~~	~~Locate the Second Point on a Plotting Board~~	~~1. Plot boards and grid squares.~~ ~~2. Use directions to locate a second point.~~
~~17D~~	~~Specify the Eight-digit Coordinates on a Military Map~~	~~1. Locate eight-digit grid coordinates.~~ ~~2. Read the protractor scales.~~

Series: Algebra

PC#	Title	Topic
18A	Solve Simple Algebraic Equations	1. Solve single-step equations. 2. Check your answers. 3. Solve multi-step equations. 4. Solve formulas by substitution.
18B	Derive Equivalent Algebraic Equations	1. Multiply fractions. 2. Divide fractions. 3. Negative and positive signs. 4. Equations with multiplication and division. 5. Addition and subtraction review. 6. Isolate unknowns. 7. Equations with squared unknowns. 8. Isolate and simplifying unknowns.
18C	Calculate with a Pocket Calculator	1. What are squares and square roots? 2. How do you use a calculator? 3. Some tips for getting correct answers. 4. Solving formulas with a calculator.

Series: Trigonometry

PC#	Title	Topic
~~19A~~	~~Use a Table of Logarithms of Functions of Angles in Mils~~	~~Use a table of logarithms on functions of angles in mils.~~
19B	Use a Table of Logarithms to Solve Multiplication and Division Problems	Practice multiplication and division logarithms.
~~19C~~	~~Solve Problems Using Trigonometric Functions~~	~~1. Parts of a right triangle.~~ ~~2. Adjacent and opposite sides.~~ ~~3. Trignometric functions.~~ ~~4. Calculator.~~ ~~5. Solve trignometric problems.~~
19D	Use Trigonometry Tables to Find the Value of a Specified Angle	Find a value for the trigonometric functions of a specified angle.

Series: Procedural Directions

PC#	Title	Topic
25A	Follow Directions to Complete a Task Activity	1. Command statements. 2. Read written instructions. 3. The order of directions. 4. Main ideas of instructions.
25B	Select Text and Visual Materials	Practice completing a task by using appropriate parts of illustrations and text.
25C	Follow Directions	1. Preparation. 2. Performance. 3. Organization.
25D	Find Main Ideas	1. The table of contents, chapter titles, and section heading. 2. Page format. 3. Topic sentences. 4. Illustration and tables.
25E	Situational Decision Making	1. Find if and then statements in the materials. 2. Compare the situation to the if statement and make a decision.

Series: Procedural Directions

PC#	Title	Topic
25F	Procedural Directions	1. Analyze the problem.
		2. Select sources.
		3. Select information from sources.
		4. Synthesize information.

Series: Vocabulary

PC#	Title	Topic
26A	Recognize Meanings of Common Task-Related Words	1. Words: As.
		2. Words: B - C.
		3. Words: Ds.
		4. Words: Es.
		5. Words: F - I.
		6. Words: J - O.
		7. Words: P - Q.
		8. Words: Rs.
		9. Words: Ss.
		10. Words: T - Z
~~26B~~	~~Recognize Tank and Aircraft Words~~	~~1. Identify parts of a tank.~~
		~~2. Identify aircraft wing positions and tips.~~
		~~3. Identify aircraft engines.~~
		~~4. Identify aircraft body and landing gear.~~
		~~5. dentify aircraft tail assemblies.~~
		~~6. dentify helicopter rotor system.~~
		~~7. Identify helicopter body, landing gear, and tail assemblies.~~

Series: Vocabulary

PC#	Title	Topic
26C	Identify the Meaning of a Word From Context	1. Clues on kinds of words. 2. Clues from parts of words. 3. Clues from other words. 4. A hint about using sound.
26D	Identify Meanings of Contractions, Abbreviations, and Acronyms	1. Contractions review. 2. Abbreviations review. 3. Acronyms review.
26E	Determine the Meaning of Figurative Language	1. Use mental images. 2. Use context clues.
26F	Recognize Radio and Navigation Terms	Recognize radio and navigation terms.
~~26G~~	~~Recognize Rifle and Survival Terms~~	~~Recognize rifle and survival terms.~~

Series: Reference Skills

PC#	Title	Topic
~~27A~~	~~Locate Documents by Titles and Code Numbers~~	~~1. Identify codes and titles.~~ ~~2. Match titles.~~ ~~3. Match codes.~~ ~~4. Identify types of references and forms.~~
27B	Locate and File Information Alphabetically	1. Alphabetize information by letters. 2. Place in order by alphanumeric codes. 3. File information alphabetically/ alphanumerically. 4. Find information in organized material.
27C	Locate Information from a Table of Contents, Index, Appendix, and Glossary	1. Table of contents. 2. Index. 3. Appendix. 4. Glossary.
27D	Locate the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems	1. Use the table of contents. 2. Use the index. 3. Track down paragraphs. 4. Zero in on tables and charts.

Series: Reference Skills

PC#	Title	Topic
27E	Skim or Scan for Relevant Information	1. Identify information by looking for context clues. 2. Identify key words. 3. Determine if the text contains key words. 4. Skim read. 5. Skim or scan for relevant information.
27F	Locate Information to Perform a Task Using Cross Reference	1. Locate documents. 2. Locating information in a document. 3. Locate information in other documents.
27G	Organize Information from Multiple Sources	1. Identify three steps in using multiple source materials. 2. Follow a guided example in using multiple sources.

Series: Tables/Charts

PC#	Title	Topic
28A	Find Information in Two-Column Tables	1. Locate a column or row within a chart or table. 2. Locate specific information within a chart or table.
28B	Find Information in Tables with Columns and Rows	1. Read a row. 2. Read a column. 3. Read rows and columns.
28C	Find Information in Complex Tables	1. Read complex tables using rows, columns and notes. 2. Find the information you need.
28D	Use Troubleshooting Tables	1. What is a troubleshooting table? 2. Types of troubleshooting tables. 3. Figures. 4. Graphs.

Series: Illustrations

PC#	Title	Topic
29A	Read Illustrations	1. Read titles. 2. Read arrows. 3. Read (--) headlines. 4. Read keys. 5. Read parts lists. 6. Read dimension lines. 7. Read inserts. 8. Read (---) leadlines.
29B	Use a Key, Legend, or Parts List	1. Read maps and legends. 2. Read keys. 3. Read parts lists.
29C	Read and Use Sections Illustrations	1. Cross sections basic training. 2. Put parts together. 3. Take objects apart.
29D	Use 3-D or Exploded Views to Complete an Action	Use an exploded view or 3-D projection.

Series: Illustrations

PC#	Title	Topic
29E	Use a Sequence of Illustrations to Follow a Procedure	1. Methods to help you read illustrations. 2. Use illustrations to follow directions.
29F	Integrate Visual Information to Select a Course of Action	1. Determine the meaning. 2. Size up the situation. 3. Get organized. 4. Select course of action.
~~29C~~	~~Reading Maps~~	~~1. Grid designators and coordinates.~~ ~~2 Legends.~~ ~~3. Contour intervals.~~ ~~4. Scale.~~ ~~5. Series name and number.~~

Series: Flow Charts

PC#	Title	Topic
30A	Identify the Meaning of Symbols on a Flow Chart	Identify the meaning of flow chart symbols.
30B	Use Flowcharts to Make Decisions	Use flow charts to make procedural decisions.
30C	Use an Organizational Chart to Identify Members of an Organization	Read an organizational chart to identify and locate units, positions, and people in an organization.

Series: Schematics

PC#	Title	Topic
31A	Use Block, Wiring, and Schematic Diagrams	1. Block diagrams. 2. Wiring diagrams. 3. Schematic diagrams.
31B	Identify Component Symbols	1. Capacitor, battery, variable inductor, FET. 2. Transformer, switch, lamp, conductor. 3. Transistor, inductor potentiometer, antenna. 4. Resistor, relay, generator, variable capacitor. 5. Ground, diode, fuse, electron tube.
31C	Trace Circuit Paths on a Schematic Diagrams	Trace circuit paths on a schematic diagram.
31D	Use a Troubleshooting Table and Schematic Diagrams	1. Troubleshooting tables. 2. Use troubleshooting tables and schematics together.
31E	Identify and Locate Parts of Schematic Diagrams	1. Identify components, test points, and signal paths in schematic diagrams. 2. Locate components, test points, and signal paths in schematic diagrams.

Series: Forms

PC#	Title	Topic
32A	Find Parts on a Form	1. 3-step procedure. 2. General areas. 3. Types of information. 4. Blocks and columns.
32B	Fill in numbers on a Form.	1. Find the type of number. 2. Find the matching number. 3. Write and double-check the number.
32C	Fill in Information on a Form.	1. Determine what information you need. 2. Find information to match what you need, enter the information, and double check it.
32D	Write Descriptive Information on a Form	1. Identify labels. 2. Locate descriptive information. 3. Summarize important facts. 4. Write descriptive accounts on forms. 5. Use all four steps.

Series: Forms

PC#	Title	Topic
32E	Locate and Compare Facts on a Form.	1. Locate and compare facts on a form. 2. Find the important facts. 3. Check your facts. 4. Compare the facts. 5. Put it all together.

Series: Note-Taking

PC#	Title	Topic
33A	Record Essential Information	1. Informal notetaking. 2. Formal notetaking.
33B	Record Mental and Written Notes	Practice taking mental and written notes.
33C	Record Information Using Sentences	1. Sentence combining. 2. Editing. 3. Notetaking.
33D	Record Information in More Advanced Situations	1. Observation reports. 2. Telephone messages. 3. Lecture notes. 4. Diagrams.

Series: Outlining (topic or sentence)

PC#	Title	Topic
34A	Identify Major and Subordinate Topics	Identify major and subordinate topics.
34B	Write Titles Using Main Ideas	Make up titles from main ideas in written information.
x34C	Select Appropriate Details for Main Ideas	Select appropriate details to support main ideas.
34D	Label the Parts of an Outline	Use numbers and letters to label topics of an outline.
~~34E~~	~~Write a Training Outline~~	~~Practice writing training outlines for a common task.~~

Series: Report Writing

PC#	Title	Topic
35A	Report Writing: Assemble Information	1. Gathering information for an informal counseling report. 2 The after-action report.
35B	Report Writing: Summarize Details for a Report	1. Who? 2. What? 3. When? 4. Where? 5. Why? 6. How?
35C	Report Writing: Select Relevant Details for a Written Report	Distinguish relevant and irrelevant details.
35D	Report Writing: Sequence Events in Logical Order	1. Collect the details needed for a report. 2. Arrange details in order. 3. Generate a written report.
35E	Report Writing: State Facts and General Impressions	Tell the difference between facts and impressions.

Series: Report Writing

PC#	Title	Topic
~~35F~~	~~Report Writing: Write a Classification Report~~	~~1. Classification.~~ ~~2. Information sources.~~ ~~3. Security classification guide.~~ ~~4. Writing a report.~~
35G	Report Writing: Summarize Events	This lesson reviews writing summaries from long reports.
35H	Report Writing: Summarize the Major Points	1. Recognize major and minor points. 2. Summarize major points.
35I	Report Writing: Write a Report that Justifies Actions Taken	1. Decision making. 2. Write a report justifying your decision.

Series: Editing

PC#	Title	Topic
36A	Spell Frequently Used Words Correctly	1. Memorization. 2. Spelling rules 1 and 2. 3. Spelling rule 3. 4. Spelling rule 4. 5. Spelling rule 5. 6. Spelling rule 6. 7. Spelling rule 7. 8. Spelling rule 8. 9. Spelling Rule 9. 10. Spelling rules 10 and 11. 11. Using context to determine spelling.
~~36B~~	~~Spell Task Related Words~~	~~1. Short words.~~ ~~2. Medium words.~~ ~~3. Long words.~~
36C	Identify Words That Need to be Capitalized	1. The first word in a sentence. 2. Using "I" as a pronoun. 3. Starting quotations. 4. Proper pronouns. 5. Titles of respect. 6. Specific areas or regions. 7. Titles of manuals and books.

Series: Editing

PC#	Title	Topic
36D	Use a Reference Source to Correct Misspellings	1. Proofread spellings using an original list. 2. Check and correct misspellings using a dictionary.
36E	Apply Punctuation Rules	1. Endmarks. 2. Commas. 3. Semicolons. 4. Colons. 5. Apostrophe. 6. Parentheses.
36F	Apply Common Rules of Grammar	1. Plurals. 2. Subject-verb agreement. 3. Pronouns, adjectives, and adverbs. 4. Negatives.
36G	Rewriting Paragraphs	1. Find the topic sentence. 2. Patterns within paragraphs. 3. Reorder sentences within a paragraph.
36H	Appraise a Written Communication and Make Adjustments to Improve Clarity	Sharpen your writing skill to get your point across clearly.

Series: Precautions

PC#	Title	Topic
~~40A~~	~~Avoid Hazards~~	~~Safety measures to help you avoid injury to yourself and damage to equipment.~~
~~40B~~	~~Apply Preventive Measures to Improve Safety and Security~~	~~Ways to apply preventive measures to improve safety or security.~~
~~40C~~	~~Identify the Best Course of Action for Common Emergencies~~	~~Common emergencies and what you should do when they occur.~~

Series: Recognition

PC#	Title	Topic
41A	Identify Similarities and Differences Between and Among Objects	1. Introduction. 2. Size, shape. 3. Number, color, location. 4. Markings, conditions.
~~41B~~	~~Identify and Use Hand and Arm Symbols~~	~~1. Signals for combat formation and battle drill.~~ 2. ~~Signals to control vehicles or convoys.~~ 3. ~~Signals to control and direct aircraft movement.~~
41C	Identify Defects or Damage to Equipment	1. Identify the equipment to be checked. 2. Determine the type of possible defect or damage. 3. Select the method for checking the problem. 4. Perform the check. 5. Determine if the defect or damage requires action.
41D	Move, Align, and Connect Objects	Move, align, and connect objects.

Series: Recognition

PC#	Title	Topic
41E	Identify Objects by Their Characteristics	1. Identify an object by color. 2. Identify an object by size. 3. Identify an object by shape. 4. Identify an object by markings.
41G	Use Your Senses to Determine a Course of Action	Use your senses to determine a course of action.
41H	Use Codes to Perform a Task	1. Identify the code to use. 2. Locate the objects with the correct codes. 3. Find the meaning of the code. 4. Use codes other than alphanumeric codes.

Series: Learner Strategies

PC#	Title	Topic
N/A	Motivational Skills Training	1. How to recognize moods. 2. Attitudes needed for using Motivational Skills Training. 3. Motivational skills "Master Game Plan": Keys to applying motivational skills in JSEP. 4. The positive self-talk tactic. 5. Use of positive self-talk tactic to improve learning. 6. Preventive measures to help you avoid inappropriate moods that interfere with efficient learning. 7. The deep breathing tactic. 8. The muscle relaxation tactic. 9. The guided imagery tactic. *OPTIONAL LESSONS

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Series: Learner Strategies

PC#	Title	Topic
N/A	Problem Solving (Math)	1. Introduction: The 4Cs plan for approaching math word problems. 2. Identification of six types of math word problems: Conversion, Averaging, Percent, Work, Distance, and Time. 3. How to identify the final goal solution and use of diagramming. 4. How to select appropriate subgoals. 5. The importance of useful techniques for checking answers to math word problems.
N/A	Time Management	1. Introduction: The importance of managing your time and activities in JSEP. 2. How to form goal plans: The difference between short- and long-term goals. 3. How to keep track of your "time on-task". 4. How and when to use self-rewards for keeping you on-task and on-schedule.

Series: Learner Strategies

PC#	Title	Topic
N/A	Reading Strategies	1. Introduction: The differences between reading tactics and reading strategies. 2. Use of the 3-step question answering tactic to locate main ideas and details in a paragraph. 3. Knowledge and use of the seven other reading tactics: Skimming, Scanning, Highlighting, Questioning, Notetaking, Elaboration, and Summarization. 4. How to identify four general reading situations for planning appropriate reading situations. 5. Use of 4Cs Reading Plan to plan, monitor, and check your reading strategy.

Series: Learner Strategies

PC#	Title	Topic
N/A	Test Taking	1. The importance of following test directions. 2. Do's and Don'ts when selecting answers to individual test questions. 3. Tips for evaluating individual answers to test questions. 4. How to eliminate potentially incorrect answers when guessing. 5. How to approach timed tests and tests that require multiple answers per page. 6. How to correctly mark an answer sheet. 7. Things to do when checking your answer sheet. 8. Three steps to follow when composing answers to test questions.

VOLUME I

PHASE I
TECHNICAL REPORT

CENTER FOR
EDUCATIONAL
TECHNOLOGY
FLORIDA STATE UNIVERSITY

Ford
FORD AEROSPACE CORPORATION

TITLE: Using the Job Skills Education Program
to Prepare Adults for Vocational or
Job Specific Training Programs

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The Job Skills Education Program
April 30, 1990

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Phase I Technical Report

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INTRODUCTION

The Job Skills Education Program (JSEP) is a computer-based, instructional program developed for the U.S. Army by the team of The Florida State University and Ford Aerospace Corporation (FSU-Ford). JSEP is designed to teach basic mathematics and language skills to learners with inadequate academic skills so they can enter initial job training or receive further training in their present military occupational specialties (MOS). JSEP does not teach specific job skills; rather, the system teaches the basic academic skills that students need to begin job skills training programs. In addition to the goal of academic improvement, JSEP is also intended to motivate students to learn, enhance performance on the job, increase students' test scores, and improve students' potential for career growth.

The Office of Vocational and Adult Education in the Department of Education (ED/OVAE), along with the U.S. Department of Labor's Employment and Training Administration (DOL/ETA) and the U.S. Department of Defense (DOD), has recognized JSEP's potential to train unemployed or underemployed Civilian adults. The transfer of the JSEP to Civilian settings should help civilians with academic skill deficiencies develop competencies necessary to learn new jobs or to advance in their existing occupations.

Although JSEP was established to guide a training program in a military setting, it is compatible with goals generated to guide Civilian training programs as well. JSEP is concerned with developing learners' basic academic skills and with enhancing academic skills that the learners may already have. The goals are not specific to the military environment nor to a specific job, but relate to basic education. Thus, the probability that these goals will transfer to Civilian training programs with similar training missions is high.

JSEP is an integrated, highly interactive instructional system hosted on Ford Aerospace's MicroTICCIT computer system. The JSEP has four major components: The Student Management System (SMS) that takes care of administrative tasks; the actual curriculum with its diagnostic and skills development lessons; testing devices that provide feedback to the students and evaluation data to the instructors; and learning strategies that teach students how to study effectively and efficiently.

Although this brief description treats the components as if each were independent of the other, they are not; each component complements and supports the others. The result is an integrated learning system that provides effective and efficient instruction. This high level of integration is critical when designing and implementing adaptation procedures: A change in one component can require changes in other components. Consequently, an accurate estimation of adaptation feasibility must consider a number of broader issues in addition to the basic mandate that calls for assessing the feasibility of adapting the JSEP to Civilian Job Training Partnership Act programs, and to the more traditional adult vocational educational training programs.

This report summarizes six key issues that FSU-Ford staff evaluated to determine issues related to the task of adapting JSEP to a Civilian environment. The first issue addresses the suitability of student screening devices and testing procedures used to diagnose learning deficiencies, designate individualized prescriptions, and evaluate students. The second issue concerns how much of the military oriented content in JSEP lessons should be changed to achieve effectiveness in a Civilian setting. FSU-Ford staff refer to this process as "degreening." The third issue deals with the question of the extent to which JSEP assessment tools can be used independently from the curriculum and the lessons. Section 4 assesses the need for change in the SMS. The fifth issue presents details about the potential Civilian population and makes estimates about necessary site personnel. And finally, the sixth issue develops the pilot test plan for the field test.

Screening Device, Tests, and Courseware

This section of the report addresses two issues that are relevant to adapting JSEP to Civilian use. First, the discussion identifies the JSEP screening device, individual tests of prerequisite competencies, and the paper-based courseware that are relevant to the Civilian occupations FSU-Ford has selected for the pilot test. Second, the components that make up a minimally acceptable package are presented.

Screening Device

FSU-Ford recognizes that a screening device or test is an essential part of JSEP and that it should have similar status in Civilian JSEP. This type of test is an effective means to predict a student's probability of succeeding in the curriculum. Consequently, FSU-Ford first considered that the most direct approach would be to adapt the military screening device to the Civilian setting directly. However, further analysis shows that two constraints limit this possibility.

The first constraint arises from the way the Army screens its recruits. The Army administers the Armed Services Vocational Aptitude Battery (ASVAB) of tests to prospective recruits as part of their recruitment process. The ASVAB functions as a threshold screening device that ensures at least minimal competency for training. As a result, when Army personnel are directed to JSEP, the JSEP screening process establishes a ceiling. That is, individuals with skills at a higher level than

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those JSEP addresses are not initially excluded from JSEP training. This process is the exact opposite of the type of screening process that Civilian JSEP requires.

The second constraint is perhaps less critical, but when combined with the first, it confounds adapting Army JSEP screening to Civilian JSEP. The screening device that is at the front end of Army JSEP's student processing is still in development. The result is that even if the JSEP screening device were appropriate, it would not be ready for dissemination and applications in time for the January, 1989, pilot test.

A possible solution to this incompatibility-unavailability situation emerges when the real benefit of the screening process is considered: The screening test determines whether a candidate can read at a level that is sufficient to meet the demands of the curriculum. And although Army screening does more than determine reading ability, the crux issues for Civilian JSEP target populations are student reading level and readability of materials. Consequently, FSU-Ford proposes to use the Test of Adult Basic English (TABE) to accomplish initial student screening.

Two other factors support using TABE. The proposed pilot test site is already using TABE as part of its student admission and placement process. This means that administrators and staff are already familiar with the test. Also, as suggested above, Civilian JSEP must screen students to establish an entry threshold. That is, a measurement must show whether a student's reading skills are high enough to succeed in the JSEP curriculum. Civilian JSEP will screen students in, not out as Army JSEP requires. In the first case the student's skills might be too low for successful program completion. In the second case they might be too high to need further training at JSEP's basic skills level.

Individual Tests and Courseware

Lessons and their companion tests comprise a major component of the JSEP instructional system. FSU-Ford staff systematically identified the MOS that have corresponding Civilian equivalents, then compiled new equivalents for Civilian occupational titles expected to be available in the pilot test. In some cases, several MOS were found to be similar to a single Civilian occupational title. Each MOS within JSEP has a list of lessons associated with it. Matching an MOS with its Civilian equivalent will generate a similar list of prerequisite academic skills for a Civilian trainee.

Using this approach to generate lesson prescriptions for Civilian occupational titles based upon the existing prescriptions for MOS depends heavily upon the assumption that the Civilian and military versions of the same job really are similar. Because the MOS-based lessons were based on an extensive job analysis effort, their content validity is high. And because no such analyses are known to have been performed on the Civilian titles, the absolute validity of the Civilian prescriptions is less certain. However, the fact that JSEP lessons teach academic skills, and not job-specific skills, increases the likelihood that prescriptions will be appropriate.

Lesson prescriptions for Army MOS each have two components. The first is the lessons that are pertinent to a specific occupation. The second component is made up of additional lessons that pertain to the larger job of "soldiering." These lessons have been labeled as "common core," and are based upon skills required of every soldier. Because they are based on the Soldiers Manual of Common Tasks, and not upon the skills involved in a particular MOS, the common core lessons have been removed from prescriptions being adapted to Civilian occupational titles.

Appendix A describes the procedures FSU-Ford staff developed for relating MOS to Civilian occupational titles. Appendix B shows the initial output of that procedure. Using the National Occupational Information Coordinating Committee (NOICC) Crosswalk, (a document that cross references military MOS with occupations from the Department of Labor's Dictionary of Occupational Titles) as well as Department of Labor descriptions of individual occupations, the 95 Army MOS included in JSEP were matched to similar Civilian titles within 37 broader categories.

Appendix C presents the occupations selected for the pilot test. Criteria for selection were numerous: Matches with JSEP MOS, high density JTPA participation, high density adult vocational education participation, high growth rate, and availability of appropriate students at the anticipated pilot test site. The selection procedure used optimizes the number of criteria met. Where these are close equivalences between the Civilian occupational title and Army MOS, the MOS have been listed. In the three cases where none of the 94 MOS in JSEP match the Civilian occupations, FSU-Ford is working with instructors at the anticipated pilot test site to develop prescriptions. Appendix D offers the draft prescriptions for the selected occupations.

Appendix E is a breakdown of the lessons that are expected to appear in the prescriptions for the Civilian occupational titles in descending order of frequency. FSU-Ford plans to revise those lessons that appear in at least half of the prescriptions. This effort will require the adaptation of both the "short" Diagnostic Review Lessons, or (DRLs) and Skill Development Lessons (SDLs).

Required Minimal JSEP Components

A minimally effective package consists of those components that ensure effective and efficient student learning. FSU-Ford considers these to be the TABE, JSEP diagnostic review and skill development lessons, and the posttests that are linked to individual lessons. These components may be considered separately from the MicroTICCIT system hardware and the Student Management System (SMS). These latter elements are parts of JSEP's lesson delivery and management systems and are assumed to be present and installed at the learning center.

TABE's proposed use has already been described above. TABE will be used to estimate whether prospective JSEP students have the threshold reading skills necessary to read the computer-based and the print-based instructional materials.

JSEP's lessons and its accompanying posttests form an integral unit. Once the SMS prescribes a particular lesson or series of lessons for a student, the corresponding tests follow as part of that prescription. Since student occupational choice and lesson prescription are individualized, a variety of lesson combinations is possible. Appendix D presents lesson prescriptions for occupations selected for the Civilian JSEP pilot test.

Determine Necessary Degreening

FSU-Ford uses the term "degreening" to describe the process of adapting the JSEP lesson content to a Civilian setting. The following questions summarize the main issues that affect successful transfer:

- Can the current JSEP be used for the pilot test and later implementation as it stands?
- If modifications are necessary, what are they?
- Given that modifications are necessary, what is the minimum amount of change necessary for implementation in a Civilian environment?

In response to these issues, FSU-Ford surveyed the JSEP curriculum, assessed its potential for Civilian adaptation, and reviewed 20% of existing JSEP computer-based and paper-based lessons. A particularly detailed examination of lessons was conducted by a curriculum and instruction specialist with both military experience and a background in teaching vocational education. The conclusion of this review process confirms the view that the underlying instructional design approach of the JSEP lessons is valid for military and Civilian applications.

The review also pointed out that the military context of many of the lessons could create difficulties in learner comprehension among Civilian students. These anticipated problems arise from the military setting of individual lessons, specialized vocabulary and terminology, and military graphics and illustrations. The concern here is that the content might distract the student's attention from the lesson's real learning objective. The review shows that this last issue is of greater concern with the verbal lessons. That is, these lessons are greener than the quantitative lessons.

Initially, FSU-Ford planned to degreen sample lessons to different degrees, producing multiple versions at various levels of greenness. The different versions would be compared, leading to the identification of some level that was both effective and efficient. This approach was revised because levels of greenness could not be identified with any precision. Further, the military context used in JSEP lessons ranges from merely contextual in some of the math lessons, such as the portrayal of a student in uniform working an addition problem, to a small number of lessons that are completely Army and should be removed from the Civilian JSEP curriculum (for example, a lesson on recognizing friendly and enemy combat aircraft).

Degreening Guidelines

FSU-Ford has developed degreening guidelines for adapting the military oriented lessons in JSEP to Civilian JSEP. These procedures reflect systematic application of instructional design principles and experience with JSEP. The guidelines are:

- Remove or adapt military context references when they have no Civilian equivalents. For example, a lesson on assembling a Light Anti-tank Weapon would be changed to some generic Civilian procedure. A military policeman giving a ticket to a driver would not be changed.

- Convert all military spellings to Civilian. Examples are aline = align, gage = gauge.

- Remove acronyms where possible. We may write them out in full form. Examples are NATO - North Atlantic Treaty Organization, SOP - Standard Operating Procedure.

- Convert military ranks and titles to generic, Civilian terms. Suggestions include substituting supervisor for sergeant, manager for captain, and president for general.

- Replace military jargon with more familiar expressions. For example, "Police the area" means the same as "Clean up the work area."

- Change graphics and illustrations only when they might confuse Civilian students or when changes in text require corresponding changes in graphics.

- Where possible, lower the readability level of the text with shorter sentences, familiar vocabulary, and by changing multi-syllable words to simpler forms.

Determine What JSEP Tools Can Be Used Independently

The following summary describes test development and evaluation procedures developed as part of the Civilian JSEP project.

Lesson Tests

The lesson tests were developed as posttests (or mastery tests) for the JSEP DRLs and SDLs. They can also serve as pretests for SDLs. The tests can be moved to the beginning of the lessons and therefore serve as pretests for the DRLs. The posttest measures student performance on all of the objectives of a prescribed lesson. The tests are computer-based and on-line for both the Diagnostic Review Lessons and the Skills Development Lessons. Independent use of the tests is feasible if they are removed from the SMS, repackaged, and norms are developed for them.

JSEP Test II

The JSEP Test II is the paper-based, revised version of the original JSEP test. It is a 196 item test covering the objectives of the entire JSEP curriculum. Ideally, students' performances on this test determine what their JSEP prescriptions will be. FSU-Ford has student test performance data at this time and is in the process of analyzing them to establish the validity and reliability of the JSEP Test II.

The JSEP Test II is paper-based and can be transferred and used independently. However, since FSU-Ford designed the test to measure individual competencies over the specific objectives taught in the JSEP curriculum, the test may be useful for diagnosing only those skills that the curriculum covers.

Locator Test

Educational Testing Service is the original developer of the Locator Test. This test can be used independently to test quantitative and verbal abilities. FSU-Ford is evaluating the test to find out if it can be combined with the JSEP Test II for use as a JSEP screening device. FSU-Ford will complete this evaluation by December, 1988.

Learner Strategies

These modules were originally developed for students lacking the basic learner skills needed to be successful in any training. The series consists of five modules that are attached to the regular JSEP curriculum. They teach students strategies for motivation, problem solving, reading, taking tests, and time management.

Reading Strategies is a five lesson, paper-based and computer-based module. It can be used independently if it is packaged with an instructor guide. The remaining lessons are primarily computer based and can be used as part of an independent learner strategies course on the appropriate computer systems.

The remaining four modules are mainly-computer based and are transferable as part of an independent learner strategies course on the appropriate computer systems. However, a complete evaluation of these lessons is still in progress. Empirical testing of the lessons will take place during Civilian JSEP curriculum pilot test beginning in January 1989.

Review the Computer Managed Instruction System

JSEP has two computer-based components that manage student progress and provide instructors with information about the effectiveness of the instruction. These components allow students to have open entry to and open exit from a lesson sequence.

Component one is the computer-managed instruction (CMI) system that resides in the TICCIT system. The CMI system performs the following functions automatically:

- Collects, stores, and sorts student responses;
- Creates reports for instructor, student, and administrative use;
- Allows students to review data about their course progress;
- Provides on-line communication; and
- Registers students for TICCIT.

The second component is the JSEP Student Management System (SMS). The SMS carries out the following tasks:

- Registers students for JSEP;
- Collects student demographic data;
- Teaches students how to use the JSEP system;
- Prescribes individualized lesson sequences and builds prescriptions;
- Directs students to prescribed lessons;
- Produces student test reports.

The SMS and CMI systems are able to manage Civilian JSEP as it is now proposed for the pilot test. Necessary changes to the systems involve modifying the procedure for assigning lesson prescriptions for students. This includes changing the military occupational specialty - prerequisite competency matrix so that it contains Civilian occupations instead of military titles. Thus, the modified SMS and CMI systems will perform all of the functions listed above as well as collecting specific student data on lessons completed, lessons in progress, lessons remaining to be completed, test scores, and time on line.

Review JSEP for JTPA Participants

This discussion presents a broad consideration of the potential learner population that includes the adult learner in a vocational educational setting in addition to JTPA participants. The rationale is that Civilian JSEP's application will serve more than one training situation and more than a single type of learner. Much of JSEP's utility lies in its potential for adaptation to a variety of learning situations and use by many student types.

In part, successful implementation depends on how well the instructional staff has been trained. Another factor in a successful implementation is how well suited the target group is for this innovative form of instruction. The discussion that follows raises issues that pertain to the learner population and presents possible resolutions. The list is not exhaustive, learner needs are varied and complicated. However, the points that the discussion addresses cover anticipated major questions.

Preliminary Preparation for Students

FSU-Ford anticipates conducting the pilot test at a facility in White Plains, New York, and has based the student analysis on the participants there. The students at the White Plains facility enter the vocational school with a wide range of reading abilities, from non-readers to above high school level. Most of the students entering the program do not have a high school diploma. Other than the ability to read English there are no entry requirements for beginning JSEP. However, for the purposes of the pilot test, we will require that students have chosen a Civilian occupation. This allows the SMS to generate a vocation-specific prescription for the student. If the student has not selected a vocational track, an option exists for a "general improvement" lesson prescription.

JSEP requires no previous experience with computers. Thus, a brief introductory explanation is all that is necessary for a learner from the target population to begin Civilian JSEP computer-based instruction. Literacy training may be necessary for students at the lowest reading levels before they can begin the program. However, students will be allowed to try JSEP before screening them out during the pilot test.

Entry Level Reading Requirement

FSU-Ford has not determined an absolute threshold entry reading level requirement for Civilian JSEP students. An initial estimate of over all JSEP reading level was at the sixth to eighth-grade level. However, this estimate cannot be made for Civilian JSEP at this time. The adaptation - degreening process is not complete. Thus, an empirical determination of reading level must be deferred until Civilian JSEP lessons are ready for pilot testing. Second, all of the soldiers who have participated in the Army JSEP field trials have been able to read the lessons. Thus, FSU-Ford has yet to discover the cutoff point below which a student can succeed in JSEP because of literacy problems. However, there are three points that need mentioning here. First, JSEP makes extensive use of graphics that are redundant to the text. These serve as clues that help the reader understand the text. Second, JSEP is self-paced. Poor readers can go slow and reread passages when necessary. Finally, the blocks of text employed are very small. The passages are not overwhelming.

Beyond estimates, FSU-Ford is investigating two empirical approaches to arrive at an accurate reading level. The first involves designing and developing an on-line computer program that will calculate the reading level for individual lessons and a student's lesson prescription. Second, FSU-Ford will sample the completed Civilian JSEP lessons randomly and apply the Flesch Readability Test to each lesson in the sample. This process will establish a range of reading difficulty and an average across the range of sampled lessons.

Preparing Students for JSEP

JSEP instructors, coordinators, or counselors will brief students before they begin JSEP instruction. The briefing will generally include:

- Purpose for enrolling in JSEP;
- Explanation of the open-entry, open-exit feature of the program;
- Explanation of the computer-based instruction and lesson format;
- How to use the paper-based lessons;
- Classroom rules and procedures;
- Motivational talk including explanation of why some of the lessons look green for Civilian JSEP students.

After the briefing, students begin work on the introductory lessons and then go on to their prescribed course of study. On-line orientation lessons introduce the MicroTICCIT computer system and JSEP.

User Friendliness

JSEP materials are designed to be very user friendly. Comments from soldiers going through the JSEP program reflect positively on the ease of use. Several features contribute to JSEP's user friendliness. The instructional materials take full advantage of the interactive capability of the computer. Students have two options for entering information responses with MicroTICCIT: Keyboard or light pen. JSEP provides prompt feedback on student responses. The system teaches learners which computer keys to use if they have a problem and how to go back and review a lesson. Options available to the learner are displayed on the screen for easy reference.

The prescription that the program prepares for each student ensures that the learner receives those lessons that are directly related to the chosen vocational tracks. Also, students study only the lessons they need to master a skill. If students can pass the posttest after finishing the short DRL material, they do not study the longer SDL. Students who fail the Diagnostic Review Lesson study the longer SDL before progressing further.

JSEP lessons use graphics to enhance information presentation. Lesson graphics take full advantage of the broad palette of colors available on the MicroTICCIT system. Finally, the computer is infinitely patient with the learner.

Review "Introduction to JSEP"

"Introduction to Using JSEP" is the introductory lesson currently in use on the MicroTICCIT system. The lesson shows students how the computer-based instructional system works, which keys they will use to respond, and how to use them, all within the context of an adventure game. The students then practice these skills on sample questions. Students receive feedback for correct and incorrect responses on practice questions similar to those used in the JSEP lessons.

However, some features require instructor elaboration:

- The instructor is needed to teach sign-on and sign-off procedures to the students.
- The instructor should explain the "NOTE" feature.

The JSEP introductory lesson requires little degreening for a Civilian learner population. For example, the words "commander" and "mission" are used early in the lesson, but it seems unlikely that they would cause any learning interference, since the context of the lesson is an adventure game familiar to players of many video games and audiences of popular television shows.

JSEP Instructor Training

JSEP instructors participate in a skills-based course that provides training in instructor responsibilities. A checklist of observable behaviors is used as a mastery test for instructors, assistants, and substitute instructors.

The length of the current instructor training course is 40 hours. FSU-Ford has used shorter and longer courses, but the 40 hour course has proved most effective. Requests for post-training assistance are minimal and instructor confidence is higher with this course.

The course is usually taught over a five day period. Days 1-3 are used for primary instruction. Day 4 is used to observe behaviors on the skill test checklist and to remediate any skill deficiencies. On day 5, new instructors are observed with JSEP students and help is offered as needed. After the instruction, instructors assume full JSEP responsibilities. FSU-Ford provides each instructor with phone numbers for support and help with problems that may arise.

Topics and Course Format for Pilot Test Instructors

The instructor training course covers the following topics:

- Personnel Procedures, JSEP Instructors, and CMI;
- JSEP History and Briefing Materials;
- Policies, Procedures, and Report Forms;
- MicroTICCIT System, Operations;
- Lessons, Tests, and Learner Strategy Lessons; and,
- Equipment Inventory, Troubleshooting, Repair and Shipping Procedures.

These topics will remain basically the same for the pilot test instructors who are outside the military. However, some revisions will be needed for Civilian JSEP to remove material that is only relevant to military settings.

Sections that discuss procedures, policies, and forms not related to instructors at Civilian adult education sites will be deleted. The MOS list will be replaced with a list of equivalent Dictionary of Occupational Titles occupations. General degreening of the manual is desirable but not necessary for the pilot test.

Instruction will be a 40-hour, instructor led course. Because the Civilian JSEP program will be new to the test sites, the previously used instructor-led course is the preferred format for teaching the necessary MicroTICCIT procedures.

Instructors who participate in the pilot test will be chosen according to the instructor requirements set out in the October, 1987, Instructor's Manual. Experience with JSEP instructors in the Army setting has shown that instructors with a military background who were not officers, and who had gone through similar instructor training programs, are the most successful as instructors. Such instructors seem to relate well to JSEP participants because of similar backgrounds.

Civilian JSEP instructors may come from either a vocational or an academic background. Vocational teachers who administer JSEP during the pilot test will have a motivational advantage. They may have expertise in the vocational area that a student is working in. Academic teachers who administer Civilian JSEP have the advantage of experience in teaching academic skills. They can diagnose problems students have in specific lessons and provide remediation. In either case, it is desirable for the instructor to have an understanding of the relationship between basic skills and the different vocational areas.

Implementing a new program often creates uneasiness and resistance to change. The pilot test instructors need to be accepting of their role as managers-facilitators rather than as primary dispensers of knowledge. In addition, establishing rapport between developers and instructors is critical. Regular contact with instructors and acceptance of instructor suggestions are necessary to foster cooperation in implementing the program. The JSEP training program has been effective at establishing good relationships.

Necessary Changes or Additional Materials

Down-time on the JSEP computer systems currently in use is rare. FSU-Ford records show that MicroTICCIT currently functions 99.74% of the time. When down time does occur, students are directed to paper-based lessons that are part of their prescriptions. While some instructors have chosen to use additional materials for remedial work, the need for supplemental materials is minimal.

CIVILIAN JSEP PILOT TEST PLAN
White Plains
January 27 - July 14, 1989

General Description

This plan details procedures to be followed in conducting the pilot test of Civilian JSEP, using selected participants at the White Plains Adult Education Center, Rochambeau School, a part of the White Plains Public School District in New York. The Rochambeau School serves approximately 2600 people through a variety of programs including adult basic education, high school equivalency, job orientation, counseling, and placement. Students targeted for this pilot will be JTPA participants, adult basic education students, the unemployed, displaced homemakers, alternative education students, and other identified categories of participants. The pilot will begin on January 30, 1989, and last through July 14, 1989. The Civilian JSEP Center will be open from 9:00 AM to 10:00 PM. Participants will be scheduled into the Center by school officials to maximize use of equipment and program.

Pilot Test Site

Rochambeau School is located in White Plains, a suburban area of New York City with a population of approximately 50,000. However, this number swells to more than 300,000 people during the day as it is a major retail and office center. Many large corporations have main offices there including Texaco, IBM, AT & T, and Nestle. The average income is about $35,000 per year.

Rochambeau School serves a diverse clientele. Major areas of focus are adult education, JTPA, economically disadvantaged and displaced homemakers, vocational apprenticeship, and alternative education programs. The school has a large community education and continuing education program. There are several branch campus programs but the Civilian JSEP Program will be located entirely at the central campus.

Because of the location of Rochambeau School, (near New York City), the many varied employment opportunities in the immediate area, the wide variety of eligible populations, the large number of available students, and the focus of educational programs at the school, it is an excellent site for conducting the pilot test for Civilian JSEP.

Participant Requirements

The program should be available to any student within the target population who desires to attend. Students must:

- Be scheduled by the school,
- Have taken the TABE to determine reading level,
- Take the practice GT of the ASVAB Examination, and
- Go through Civilian JSEP orientation session.

Personnel, Facilities, and Equipment

The school district will provide the necessary classrooms, instructors, trainees, and the MicroTICCIT systems with sufficient workstations to conduct the trail. Florida State University will provide all required JSEP courseware and data collection instruments such as tests, attitude survey, and follow-up instruments. FSU-Ford will install all computer equipment in the designated classrooms. Staff from FSU-Ford will conduct on-site training and orientation to school staff, instructors, and administrators. FSU-Ford will be available by phone to assist the instructor(s) and administrators upon request. FSU-Ford will also coordinate the planning and assessment of the pilot project with administrators from Rochambeau school.

Evaluation

Specific procedures, analysis, and models to be used in evaluating the pilot test are required in Task 18 of this project. However, some elements of the evaluation plan are identified here because they are integral parts of implementation. It is worth mentioning here that some of the students may be reluctant to take tests, especially pretests. We will conduct a reasonable amount of testing while remaining sensitive to students' test anxiety.

Instructional effectiveness will be measured in two ways. All students will take the JSEP Test II on a pretest-posttest basis. This is a paper-based test that is directly related to JSEP lesson content. It is a power test rather than a timed test, typically requiring about three hours to complete. Since most students will not take all of the lessons in the JSEP curriculum, some procedure must be developed for discarding items that are referenced to lessons each individual student did not complete. This will be addressed further in Task 18 of this project.

The other means of measuring instructional effectiveness employs the posttests attached to each lesson. These, too, are criterion referenced tests. Typically, a student takes a short review lesson, followed by a test. If the student does not meet a predetermined score, the longer tutorial lesson is required. Then the student takes the test again. If the student does not pass the test at this point, the tutorial lesson and test are repeated again.

Gain scores on the JSEP Test II will give an indication of the effectiveness of individual lesson prescriptions within the curriculum. Similarly, with students who must take the individual lesson test more than once, gain scores on these tests will indicate the effectiveness of using the additional instruction embodied in the skill development lessons.

Efficiency of the system is related not only to student outcomes, but also to the amount of time required to reach mastery. Data will be available to compare learning rates for all participants in terms of time on task, gender, age, program, and completion rate between the Army pilot tests and this Civilian test. Analysis of these data should answer questions addressed in Task 18 of this project.

Another instrument that will be considered for use is a practice form of the General Technical (GT) section of the Armed Services Vocational Aptitude Battery (ASVAB). The practice GT was developed and validated at Fort Lewis. This test consists of 15 verbal and 15 math questions. This test is not based on JSEP, and is not a part of JSEP. It was developed to watch the actual GT so that soldiers could practice taking the real test. Because this test is not referenced to the JSEP curriculum, it will be used on a pretest only basis, as gain scores would make no sense with this use of the instrument. The reason for including this test is that it will provide a basis for comparing JSEP soldiers and JSEP civilian students.

A cost model will be selected and applied to the Civilian JSEP project which deals with both capital costs for the program and operation costs. Per student costs and program cost can be calculated using existing school district reporting procedures and other readily available data. Costs for the Civilian JSEP program may then be compared to costs for other programs at the school site.

A measure of the success of the project can be obtained from use or adaptation of the "Post JSEP Attitudinal Survey" developed by The American Institutes for Research. This survey is designed to answer questions relating to participant reaction and feeling about the JSEP program (e.g., clarity of content, participant and staff acceptance of operating procedures; and how well the management system operates in the Civilian setting.)

Follow-up Studies

Follow-up studies should be conducted to determine the long term effectiveness of the Civilian JSEP project. There are many questions to be addressed. For example:

- Do Civilian JSEP participants complete job training more often than non-participants?
- Do Civilian JSEP participants complete programs (vocational or academic) at a faster rate than non-participants?
- Do Civilian JSEP participants score higher in vocational or academic training than non-participants?
- Are participants more successful than non-participants in jobs as measured by rat, retention or advancement in employment?
- Do Civilian JSEP participants from some groups e.g. gender, ethnic, age have a higher success rate in improving functional basic skills than other groups?
- Do Civilian JSEP participants feel the program increased their ability to learn or advance in their chosen vocation?
- What parts of Civilian JSEP require additional refinement?

These are examples of questions that cannot be answered in a brief trial period. A long-term evaluation should be conducted to determine whether JSEP in the Civilian setting is meeting long-term expectations.

Schdule for Civilian JSEP
WHITE PLAINS PILOT TEST
January 30, 1989 - July 14, 1989

Dates	Events
Aug. - Sept.	• Planning among FSU-Ford, NYED and White Plains Staff.
Sept.	• White Plains to select instructor(s) and identify room(s) for Civilian JSEP.
	• Identify target population and preliminary list participants for Civilian JSEP (e.g., dislocated workers, ESL, alternative education, JTPA.
Sept. - Oct.	• Data collection instruments designed and procedures developed for accessing instructional efficiency and effectiveness of Civilian JSEP.
	• System developed between NYED, White Plains, and FSU-Ford to follow-up progress of participants after completion of Civilian JSEP.
Oct.	• White Plains designs master schedule and procedures for managing Civilian JSEP participants.
Oct. - Nov.	• Agreements made between White Plains and impacted organizations (e.g., other night programs, teacher unions and other identified organizations.
Jan. 3 - 27	• Finalize participant list. Civilian JSEP rooms set up.
	• Participants are scheduled.
Jan. 16 - 20	• FSU-Ford install TICCIT systems.
Jan. 23 - 27	• Operations and instructor training for Civilian JSEP instructors.
Jan. 30	• Pilot begins: Orientation, testing and prescriptions.
Jul. 14	• Pilot ends.

APPENDIX A

A process for relating Military Occupational Specialties (MOS) to civilian occupational titles is presented in this section. This process was applied to MOS addressed in the JSEP curriculum, with the results presented in Appendix B. The process may also be used with MOS that have not yet been included in the JSEP.

Appendix A: PROCESS FOR RELATING JSEP LESSON MODULES TO CIVILIAN OCCUPATIONS

Task 5 of the contract VN88003501 requires the Civilian JSEP contractor to "Develop a procedure for relating JSEP lesson modules to Civilian occupations. The development is expected to include a review of: a. The materials available from the Army Research Institute which relate the prerequisite competencies (PCs) to specific Military Occupational Specialities (MOS). b. The National Occupational Information Coordinating Committee (NOICC) Crosswalk in relation to the 94 MOS from which PCs are derived."

After reviewing the extensive job analysis of MOS conducted by RCA for the Army's Training and Doctrine Command, the Civilian JSEP project staff began the task of matching PCs to Civilian occupations by comparing MOS to Civilian occupations. If the MOS to Civilian occupation comparisons were good matches, the "civilianizing" of JSEP's lesson modules' prescription system would be a simple process of substituting Civilian occupational titles for the existing MOS titles in JSEP's Student Management System. The SMS could then continue to prescribe PCs to specific Civilian occupations unaltered from the current matches to MOS.

MOS to DOT Crosswalk Match

The feasibility of substituting Civilian for military titles hinges upon the premise that the basic academic skills needed for an MOS are the same as is needed for its counterpart Civilian occupation. The first step in testing this premise is to determine which Civilian occupational titles from the Dictionary of Occupational Titles (DOT) are comparable to MOS titles. The NOICC Crosswalk data base was consulted to identify the DOT titles that matched MOS titles. Since the MOS-PC matrices used by JSEP's SMS were developed for skill levels one and two of 94 MOS, only Civilian occupational titles with comparable beginning skill levels were selected from the Crosswalk data base. There were many multiple matches which led to a total of over 180 DOT titles corresponding to the 94 MOS titles. For example, MOS 44B-Metal Worker had five DOT Crosswalk matches: *Welder; Auto-Body Repairer; Shipfitter; Auto-Radiator Mechanic; and Painter, Transport Equipment.*

To determine the appropriateness of these 94 MOS to 180 DOT matches, and to identify possible overlap among the 180 DOT titles, a more extensive description of the occupations was needed than the Crosswalk data base provided. The DOT was consulted to obtain brief descriptions of job responsibilities and listings of potential employment sectors for each occupation. Those occupations listing "military service" as their only potential employers were dropped from the 180 DOT titles. This brought the matches down to 125 truly Civilian occupations.

DOT's Mathematics and Language Scales

The DOT description of an occupation's activities is limited. It lacks any details of basic academic skill requirements. To determine how comparable the DOT titles are to MOS titles, a more detailed explanation of basic mathematics and language skills requirements is needed for the 125 Civilian occupations. A supplement to the DOT, entitled Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles contains basic mathematics and language skill levels for all 125 occupations. These basic skills levels are presented in the form of scales from lowest (1) to highest (6) for both mathematics and language.

Scale of General Education Development

LEVEL	MATHEMATICAL DEVELOPMENT	LANGUAGE DEVELOPMENT
6........	•***Calculus:*** work with limits continuity, real numbers, mean value theorems, and implicit function theorems. •***Algebra:*** theories of groups, rings, and fields. differential equations, linear algebra, infinite series, advanced operations methods, and functions of real and complex variables. •***Statistics:*** mathematical statistics probability and applications, experimental design, statistics, inference, and econometrics.	•***Reading***: literature, book and play reviews, science and technical journals, abstracts, financial reports, and legal documents. •***Writing***: novels, plays, journals, editorials, speeches, manuals, critiques, poetry, and songs. •***Speaking:*** theory, principles, and methods of effective and persuasive speaking, voice and diction, phonetics, and discussion and debate.
5........	***Algebra:*** exponents and logarithms, linear equations, quadratic equations, mathematical induction and binomial theorem, and permutations. •***Calculus:*** analytic geometry, differentiations and integration of algebraic functions with applications. •***Statistics:*** frequency distributions, reliability and validity of tests, normal curve, analysis of variance, correlation techniques, chi-square application and sampling theory, and factor analysis.	•**Same as level 6**
4........	***Algebra***: Deal with system of real numbers; linear, quadratic, rational, exponential; logarithmic, angle, and circular functions, and inverse functions, related algebraic solution of equations and inequalities; limits and continuity, and probability and statistical inference. ***Geometry***: Deductive axiomatic geometry, plane and solid; and rectangular coordinates. ***Shop Math:*** Practical application of fractions, percentages, ratio and proportion, mensuration, logarithms, slide rule, practical algebra, geometric construction, and essentials of trigonometry.	***Reading***: Read novels, poems, newspapers, periodicals, journals manuals, dictionaries, thesauruses, and encyclopedias. ***Writing:*** Prepare business letters, expositions, summaries, and reports using prescribed format and conforming to all rules of punctuation, grammar, diction, and style. ***Speaking***: Participate in panel discussions, dramatizations, and debates. Speak extemporaneously on a variety of subjects.
3........	Compute discount, interest, profit, and loss; commission, markups, and selling prices; ratio and proportion, and percentages. Calculate surfaces, volumes, weights, and measures. ***Algebra***: Calculate variables and formulas, monomials and polynomials; ratio and proportion variables; and square roots and radicals. ***Geometry:*** Calculate plane and solid figures circumference, area, and volume. Understand kinds of angles, and properties of pairs and angles.	***Reading:*** Read a variety of novels, magazines, atlases, and encyclopedias. Read safety rules, instructions in the use and maintenance of shop tools and equipment, and methods and procedures in mechanical drawing and layout work. ***Writing:*** Write reports and essays with proper format, punctuation, spelling, and grammar, using all parts of speech. ***Speaking***: Speak before an audience with poise, voice control, and confidence, using correct English and well-modulated voice.

2........	Add, subtract, multiply, and divide all units of measure. Perform the four operations with like common and decimal fractions. Compute ratio, rate, and percent. Draw and interpret bar graphs. Perform arithmetic operations involving all American monetary units.	***Reading:*** Passive vocabulary of 5000-6000 words. Read at rate of 190-215 words per minute. Read adventure stories and comic books, looking up unfamiliar words in dictionary for meaning, spelling, and pronunciation. Read instructions for assembling model cars and airplanes. ***Writing***: Write compound and complex sentences, using cursive style, proper end punctuation, and employing adjectives and adverbs. **Speaking**: Speak clearly and distinctly with appropriate pauses and emphasis, correct pronunciation variations in word order, using present, perfect, and future tenses.
1........	Add and subtract two digit numbers. Multiply and divide 10s and 100s by 2, 3, 4, 5. Perform the four basic arithmetic operations with coins as part of a dollar. Perform operations with units such as cup, pint, and quart; inch, foot, and yard; and ounce and pound.	***Reading***: Recognize meaning of 2500 (two- to three- syllable) words. Read at a rate of 95-120 words per minute. Compare similarities and differences between words and between series of numbers. ***Writing:*** Print simple sentences containing subject, verb, and object, and series of numbers, names, and addresses. ***Speaking***: Speak simple sentences using normal word order, and present and past tenses.

As the above scale definitions indicates, the six DOT skill levels are not as specific as the extensive analysis done for the MOS-PCs used in JSEP's SMS. Under the JSEP system each MOS is broken down into specific job skills. Basic mathematics and language skills are identified for each MOS job skill. This detailed matching of basic mathematics and language skills to specific job skills was used as a basis for developing specific MOS lesson matrices. In contrast, the six DOT mathematics and language skills levels are general and categorical in nature. For example, the mathematics skill level listed in the DOT Supplement for the Civilian occupations Radio Mechanic and Stock Clerk are the same. Both listed mathematics skill level 3 as necessary for either job. In reality, the specific mathematics skills needed to train a Radio Mechanic are very different from the specific mathematics skills needed to train a Stock Clerk. Under the JSEP SMS, the MOS lesson module matrix for *32D-Station Technical Controller*, the MOS equivalent to the DOT Radio Mechanic, is made up of a different combination of mathematics lesson modules than the matrix for *76C-Equipment Records and Parts Specialist*, the MOS equivalent to Stock Clerk. JSEP's MOS lesson matrices are tailored to the specific mathematics and language skills requirements for each MOS. The six DOT skills levels are more comparable to grade levels of mathematics and language skills and are not specific enough for use as bases for designing tailored Civilian occupation-lesson matrices.

Likewise they are not helpful in determining if the basic skill requirements for Civilian and military occupations are comparable. To determine the compatibility, specific job skills of each Civilian occupation must be identified and tied to mathematics and language lessons in JSEP in the same way that the original MOS job skills were matched to the JSEP lessons.

Overlap Among Lesson Modules

As stated earlier, there were many multiple matches in the MOS to DOT Crosswalk data base. This explains why 94 MOS titles were crossed to 125 DOT titles. In attempting to find the amount of overlap between the various DOT titles, lessons from each MOS lesson specific to each Civilian occupation were matched. When a DOT title showed multiple MOS title matches, those MOS lessons were compared to each other. This comparison was undertaken to find if there were substantial overlaps among the various lesson prescriptions for the MOS. If the SMS prescribed the same lesson modules, then the military and Civilian prescriptions should be the same.

However, there was little overlap among the various MOS prescriptions. As few as 20% of the lessons might be prescribed for all affected MOS. With this small amount of overlap, no simple substitution of DOT titles for MOS titles in the MOS lesson modules matrix was possible.

Unique MOS Job Skills

During the examination of specific MOS prescriptions, it was noted that some lessons were being prescribed that did not seem appropriate for the job skills involved in either the MOS or Civilian occupation. For example, *MOS 94B-Food Services Specialist* was matched to DOT title Cook in the Crosswalk data base. The MOS lesson module matrix for Food Services Specialist prescribes lesson module "15D: Using the Oscilloscope." This lesson teaches the student how to operate and read an oscilloscope. This was an unusual lesson to be prescribed as a prerequisite skill for a cook. Upon further investigation it was learned that other MOS lesson module matrices also were prescribing the oscilloscope lesson in a seemingly inappropriate manner. To understand this possibly incorrect application of a lesson module, the job skills for MOS 94B Food Service Specialist were examined. It was found that a military cook must set up and operate a field kitchen. Part of field operations is using an electrical generator to run kitchen equipment. Therefore, this lesson is appropriate for a military cook who relies upon a generator for power in the field. However, operating a field kitchen is not an integral part of a Civilian cook's job, and the lesson on using an oscilloscope is not appropriate in the Civilian environment.

Alternative Procedures

To summarize, we were not able simply to substitute Civilian occupational titles for MOS titles in the lesson module prescription matrices of the SMS. This was due to three facts discovered in the process of trying to match lessons to Civilian occupations: (a) The DOT 1-6 scale of basic mathematics and language skills is too general to match specific JSEP lesson; (b) there is minimal overlap among lesson prescriptions in the various MOS lesson module matrices that applied to a single Civilian occupation and (c) there are specific mathematics and language skills required for MOS that are not required for their Civilian counterparts' job skills.

There are two alternative procedures for relating JSEP lesson modules to Civilian occupations. The first procedure is to duplicate the process used in JSEP to match MOS to lesson modules. That is, the individual Civilian occupation is broken down into its specific job skills using an extensive job analysis. These individual job skills are then used as the foundations selecting mathematics and language lesson modules that make up the job lesson module matrices. The advantage of this procedure is its specificity. The match of Civilian occupation with lesson modules is specific to each occupation. The mathematics and language skills prescribed are tied specifically to the occupation's job skills.

Only those mathematics and language skills needed to learn the job are taught. The disadvantage of this tailored procedure is its need for substantial job skills information and the amount of time required to develop the match between each job skill and lesson modules. A detailed job skills list must be developed for this procedure. Further, the brief occupational descriptions in the DOT are not sufficient to serve as foundations for selecting lessons. Many states have developed such job skills lists for occupations taught in their vocational schools. In Florida, these job skills lists are entitled "Student Performance Standards." Once adequately detailed job skills lists are obtained, the time consuming and difficult task of matching mathematics and language skills to each job skill must be done. The outcome of this matching process will be tailored prescriptions of lessons that teach only the mathematics and language skills required to learn the specific job skills.

The second recommended procedure for relating lessons to Civilian occupations is tied to the six mathematics and language skills levels in DOT's "Scales of General Education Development." Since all DOT titles are classified by both General Education Development mathematics and language levels, this procedure matches the lesson modules to these two scales directly. There is a possibility of 36 (6 mathematics x 6 language) combinations. That is, scale-lesson modules matrices would be developed for each of the 36 possible combinations of mathematics and language levels. The advantage of this kind of general procedure is its universality. No matter what occupation is identified, a prescription is available as long as it is listed in the DOT. The amount of time involved in relating lesson modules to Civilian occupations would be substantially less than the first tailored procedure described above, since no job skills development or matching to lessons would be done. The disadvantage of this general procedure is its lack of specificity. As stated earlier, the fact that a *Radio Mechanic and Stock Clerk* are both classified as level "3" in mathematics, does not mean that both use the same mathematics skills on the job. This general procedure prescribes some lesson modules that are not directly relevant to a specific occupation.

The amount of available time and required level of specificity would govern the choice of procedures. If the most important use of the job-lesson module matrix is to prescribe only those specific lesson modules that are needed for the specific job skills of an occupation, then the first, more complex procedure is most appropriate. If the most important use of the job-lesson module matrix is to prescribe lesson modules that will take the learner to a general level of mathematics and language skills associated with a category of occupations, then the second, less complex procedure is the choice.

APPENDIX B

The MOS represented in the JSEP curriculum were matched with job titles from the Dictionary of Occupational Titles, using the procedure described in Appendix A. Civilian occupational titles were then clustered into broad categories. Then, as an indicator of the similarity of titles within clusters, skill level definitions from the DOT Scale of General Education Development were matched to the titles. These scale levels are defined in Appendix A, and appear in this section as a three digit code to the right of the titles. The first digit is mathematics development, measured on a scale of 1 to 7. The second digit is language development, also measured on a 1 to 7 scale. The third digit is training time required, measured on a 1 to 9 scale.

Appendix B: GENERAL GROUPINGS OF DOT TITLES

AIR-TRAFFIC CONTROLLER	347
AIRCRAFT BODY REPAIRER	
Painter, Transportation Equip.	226
Aircraft Body Repairer	337
Skin Fitter	227
AUTOMOBILE BODY REPAIRER	
Painter, Transportation Equip.	226
Auto-Body Repairer	347
CLERK	
Clerk, General	232
Stock-Control Clerk	335
Parts Clerk	225
Inventory Clerk	334
Material Clerk	325
Shipping & Receiving Clerk	325
Stock Clerk	324
Procurement Clerk	334
Sales Clerk	323
Stock Clerk, Self-Service Store	335
Administrative Clerk	334
Clerk-Typist	234
Personnel Clerk	244
COMPUTER OPERATOR	
Programmer, Detail	345
Computer Operator	236
CONSTRUCTION EQUIPMENT OPERATOR	
Bulldozer Operator I	125
Operating Engineer	226
Scraper Operator I	125
CONSTRUCTION WORKER	
Blaster	447
Construction Worker II	112
Rigger (Construction)	124
Rigger (Any Industry)	226
DOCK WORKER	
Stevedore I	225
Stevedore II	112

Boat Loader I	223
Cargo Checker	224
ELECTRICIAN	
Electrician, Airplane	337
Electrician, Powerhouse	438
Electrician, Radio	437
EQUIPMENT CRATER	123
FABRIC REPAIRER	
Alteration Tailor	337
Canvas Repairer	114
Mender	124
Parachute Mender	113
FOOD SERVICE	
Baker	226
Butcher, Meat	226
Cook	337
Cook, School Cafeteria	226
FURNACE INSTALLER	337
JOURNALIST	
Newswriter	257
Reporter	357
Photo Journalist	247
LAUNDRY OPERATOR	
Dry Cleaner	225
Laundry Operator	123
Laundry Worker, II	112
Washer, Machine	224
LAW	
Paralegal Assistant	257
Legal Secretary	246
LAW ENFORCEMENT	
Correction Officer	224
Guard, Security	123
Police Officer I	236
Prisoner-Classification Interviewer	347
Sheriff, Deputy	235
State-Highway Police Officer	236
LOGGER	114

MACHINIST

Machinist	437
Machinist, Maintenance	437
Machine Set-Up Operator	436
Machinist, Marine Engine	337

MEDICAL TECHNICIAN

Elecroencephalographic Technologist	446
Emergency Medical Technician	345

MECHANIC, AIRCRAFT

Airframe-and-Power-Plant Mechanic	447
Pneumatic Tester and Mechanic	336

MECHANIC, DIESEL

Construction-Equip. Mechanic	337
Mechanic, Industrial Truck	337
Mechanic, Endless Track	337
Powerhouse Mechanic	338
Diesel Mechanic	337

MECHANIC, GAS

Automobile Mechanic	337
Construction-Equipment Mechanic	337
Mechanic, Industrial Truck	337
Tractor Mechanic	337
Automobile-Radiator Mechanic	236
Mechanic, Endless Trace	337
Gas-Engine Repairer	336
Powerhouse Mechanic	338

MECHANIC, MARINE

Maintenance Mechanic Engine	337
Motor Mechanic	337

PARACHUTE MAINTENANCE

Parachute Folder	113
Parachute Inspector	122
Parachute Rigger	225
Parachute Mender	113

PETROL./CHEM. STORAGE

Fuel-System-Maintenance Worker	337
Line Walker	234
Loader I	
Pumper-Gager	337

RELIGIOUS ACTIVITIES DIRECTOR	358

REFRIGERATION MECHANIC	
Envir.-Control-System Installer-Ser.	338
Refrigeration Mechanic	338
SHIPFITTER	328
SHIP WORKER	
Able Seaman	225
Motorboat Operator	235
Deckhand	114
Ordinary Seaman	114
SURVEYOR	
Surveyor Assist., Instruments (Prof.)	547
Geodetic Computer (Prof.)	546
TELECOMMUNICATION INSTALLER	
Cable Splicer	337
Line Installer-Repairer	337
Private-Branch-Exchange Installer	337
TELECOMMUNICATIONS MAINTENANCE	
Automatic-Equip Technician	437
Radio Mechanic	337
Avionics Technician	446
Electronics Mechanic	447
TELECOMMUNICATION OPERATIONS	
Central-Office Operator	133
Radio Telephone Operator	347
Telegraphic-Typewriter Operator	234
Telephone Operator	233
TRUCK DRIVER	
Tank-Truck Driver	123
Tractor-Trailer-Truck Driver	234
Truck Driver, Heavy	224
Truck Driver, Light	223
WAREHOUSE OPERATIONS	
Industrial Truck Operator	113
Material Handler	113
WELDER	336

APPENDIX C

Twenty civilian occupational titles were selected for inclusion in the Civilian JSEP adaptation effort. These titles were selected according to several criteria: (a) They appear in the NOICC Crosswalk, (b) they match some of the MOS included in the JSEP curriculum, (c) they are strongly funded by JTPA programs, (d) they reflect vocational education instructional programs, (f) they are growing occupations; and (g) they represent programs for which students are available during the pilot test. Not all of the titles meet all of these criteria, but all comply with most of the conditions.

Appendix C: KEY TO THE 20 SELECTED CIVILIAN TITLES

MOS-JSEP CODES

The combined number and letter codes before the slash are the Army Military Occupational Specialty (MOS) codes for Army occupations that are comparable to the civilian occupations listed. If there are no Army equivalents, the letters "NA" are used.

The codes after the slash are JSEP-MOS codes. These MOS codes come from the 95 military occupations taught in JSEP. Multiple MOS listings after the slash show that the listed civilian occupation has similiar job tasks to those of the MOS. However, no single MOS contains all the civilian occupation's job tasks. If there are no JSEP-MOS that are similiar to the civilian occupation, the letters "NA" appear after the slash.

FL. JTPA RANK

The Florida State Office of the Job Training Partnership Act (JTPA) provided information on the top 20 state programs in terms of JTPA client recipient enrollment. These rankings refer to clusters of occupations rather than a single occupation. Comparable national data were not available.

FL. VOC. ED. RANK

The Florida Department of Education provided rankings for vocational education programs using enrollment data for all adult post-secondary vocational education students in the state. This information was provided by program title under the Classification of Instructional Programs (C.I.P.) codes. The top 32 programs were included out of a total of approximately 250 programs. National enrollment data are not currently collected.

1986-1994 GROWTH

This figure represents the projected percentage growth in total number of individuals employed in the listed occupations from 1986 to 1994. The projection figures are from the Bureau of Labor Statistics, U. S. Department of Labor.

WHITE PLAINS CURRICULUM

The potential pilot site at White Plains, New York has instructional programs in the civilian occupations noted by a "yes" in this column. A "no" means that the potential pilot site does not offer training in the listed occupation.

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DOT TITLE	MOS/JSEP NUMBERS	FL. JTPA RANK	FL.VOC.ED RANK	1986-'94 GROWTH	WHITE PLAINS CURRICULUM
Accounting Clerk	73d/711, 75b 76p, v, x, y	8	32	35%	YES
Auto-Body Repairer	44b/44b	16	18	18%	YES
Bookkeeper	NA/711,75b 76p, v, x, y	8	32	6%	YES
Carpenter	51b/12b 76v	12	29	11%	YES
Clerk-Typist	75e/711 75b, 76c	1	2	1%	YES
Computer Operator	72g, 74d/ 74d, f	2	**	46%	NO
Correction Officer	95c/95c	4	24	35%	NO
Cosmetologist	NA/NA	9	3	29%	YES
Electrician	51r/261 32d, h	19	20	16%	YES
Electronic Assembler	NA/NA	*	25	***	YES
Fire Fighter	51m, 95b 91a	4	10	16%	YES
Floral Designer	NA/NA	20	15	***	YES
Home Health Aide	NA/91a	3	**	***	YES
Lic. Practical Nurse	91c/91a	3	**	18%	YES
Machinist	44e/44e	*	31	11%	YES
Nurse Aide	NA/91a	3	6	29%	YES
Plumber	51k/52c	12	**	15%	YES
Police Officer 1	95b/95b	4	4	14%	YES
Record Keeper	NA/711, 75b 76p,v,x,y	8	**	12%	YES
Word Processor	NA/74b,75b	2	11	30%	YES

* Not in top 20 Florida JTPA programs
** not in top 32 Florida Voc. Ed. Programs
*** no growth percentages available
8/24/88

APPENDIX D

Draft prescriptions have been created for the civilian occupational titles presented in Appendix C. Three prescriptions are still under construction: (a) Cosmetologist; (b) Electrical Assembly Technician; and (c) Floral Designer. This section presents lesson titles from the JSEP curriculum, followed by draft civilian prescriptions.

Appendix D

PC SERIES: NUMBERING AND COUNTING

01A	Match Numerals with Word Names and Models
01B	Write Numerals in Sequence from any Starting Point
01C	Identify the Number that Comes Before, After, or Between, Any Two Given Numbers
01D	Identify a Number Which is Greater or Lesser from a Set of Numbers
01E	Identify an Object with a Specified Ordinal Position
01F	Write or State the Place Value of a Particular Digit, Whole, or Decimal Number
01G	Round a Whole or Decimal Number to a Specified Place
01H	Count by Ones, Two, Fives, Tens, etc., Backward or Forward
01I	Match Numbers or Points with Intervals or Scales that can be Represented as a Number Line (with or without numbers)

PC SERIES: LINEAR, WEIGHT, AND VOLUME MEASURES

02A	Interpret the Markings on a Linear Scale
02B	Identify Units of Measure in US Standard and Metric Systems and Classify Units According to Type of Measure
02C	Measure Lengths of Objects or Distances Using a Ruler, Yardstick, Meter Stick, or Scale
02D	Identify Measures of Weight (ounces, pounds, grams), Pressure (pounds per square inch), and Torque (foot pounds)
02E	Identify Measures of Volume in Pints, Quarts, Liters, and Parts of Them
02F	Measure with a Non-Numerically Calibrated Scale
02G	Use Existing Objects or Concepts to Measure or Estimate Size or Distance

PC SERIES: DEGREE MEASURES

03A	Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B	Estimate the Measure of a Given Angle Not Greater Than 180 Degrees
03C	Interpret Azimuths, and Other Contexts in Which the Measure of an Angle May Range from 0 to 6400 Mils
03D	Interpret Azimuths, and Other Contexts in Which the Measure of an Angle May Range from 0 to 360 Degrees

PC SERIES: TIME-TELLING MEASURES

04A	Tell Time Using Digital, Analog, and 24 Hour Clocks
04B	Use the Positions on a Clock Face to Indicate Direction
04C	Estimate Time in Seconds, Minutes, and Parts of an Hour

04D Determine Equivalent Dates from One Calendar Form to Another Using Gregorian and Julian Calendars
04E Convert Time to Hours and Tenths of Hours
04F Convert to Zulu (Greenwich Mean Time)

PC SERIES: GAGE MEASURES

05A Read and Interpret a Gage (numbered, meter, caliper, or feeler)
05B Read and Interpret a Display Read-Out
05C Read and Interpret a Gage with Color Divisions
05D Read and Interpret Scales with (+) and (-) Demarcations
05E Read and Interpret Scales on a Multiscale Gage
05F Match a Gage Reading to a Specification
05G Read and Interpret Unnumbered or Unmarked Gage Type Instruments
05H Read and Interpret a Gage Which is Fluctuating or Momentarily Sustained
05I Match Specifications of Required Measures by Manipulation, Alinement, or Maintenance

PC SERIES: SPATIAL

06A Identify Directions That Tools, Hardware, or Components may be Moved
06B Manipulate Objects so they are Alined, Parallel, Perpendicular, or at an Angle
06C Interpret Distance and Directional Relationships of Figures and Objects From Two Dimensional Drawings
06D Relate Symbols and Graphic Representations to Actual Systems, Subsystems, and Components

PC SERIES: LINES

07A Identify Points, Lines, Parts of Lines (segments) and Rays
07B Identify Vertical, Horizontal and Diagonal Lines
07C Identify Intersecting, Divergent, Perpendicular, and Parallel Lines
07D Aline Lines so they are Superimposed
07E Draw Lines

PC SERIES: PLANES

08A Identify and Match Plane Geometric Shapes and Plane Common Shapes
08B Identify Characteristics of Geometric Shapes
08C Apply Shape Terms to Objects and Plane Figures
08D Match Patterns of Figures (both actual size and model drawings)

08E Identify Orientation of Figures

PC SERIES: ANGLES AND TRIANGLES

09A Identify Angles
09B Identify Vertical, Horizontal, Complementary, and Supplementary Angles
09C Identify Types of Triangles
09D Identify Altitudes and Bisectors of Angles and Triangles
09E Name Angles by Using Letters and Numbers

PC SERIES: SOLIDS

10A Recognize and Match Names of Solids with Their Corresponding Figures

PC SERIES: TERMINOLOGY

11A Identify Shape and Position Terms
11B Identify Spatial Orientation Terms with Positions

PC SERIES: ADDITION AND SUBTRACTION

12A Add and Subtract Whole Numbers without Carrying or Borrowing
12B Add and Subtract Whole Numbers with Carrying and Borrowing
12C Add and Subtract Decimals with Borrowing and Carrying
12D Add and Subtract Positive and Negative Numbers
12E Add and Subtract 24 Hour Times
12F Add and Subtract Increments on Gages, Dials, and Other Measuring Instruments
12G Add and Subtract Linear, Dry, Liquid, or Degree Measures
12H Estimate a Sum or Difference

PC SERIES: MULTIPLICATION AND DIVISION

13A Multiply and Divide Whole Numbers
13B Multiply and Divide Whole and Decimal Numbers
13C Divide Numbers with Decimals in Both Divisor and Dividend
13D Multiply and Divide Negative and Positive Numbers
13E Estimate a Product or Quotient

PC SERIES: FRACTIONS/DECIMALS

14A Estimate Fractional Lengths, Distance, Area, and Volume
14B Reduce Fractions to Lowest Terms
14C Convert Fractions (proper and improper) to Decimal Equivalents, and Vice Versa, Using a Table, Chart , or Gage

14D	Convert Decimals and Percentages to Fractions and Vice Versa
14E	Add and Subtract Fractions with Same or Different Denominators
14F	Multiply and Divide Fractions with and without Whole Numbers
14G	Estimate a Fractional Sum, Product, or Quotient

PC SERIES: GEOMETRY

15A	Draw Plane Geometric Figures
15B	Match Geometric Figures with Word Names
15C	Label Specified Objects and Figures
15D	Use a Protractor
15E	Construct or Draw Perpendicular Lines Using a Protractor
15F	Compute the Area and Perimeter of a Rectangle
15G	Measure Radius and Calculate Area and Circumference of a Circle
15H	Measure Rectangular Shaped Solids
15I	Use Formulas to Solve Problems Involving Geometric Figures
15J	Solve Problems Involving Oscilloscope Readouts

PC SERIES: COMBINATION OF PROCESSES

16A	Locate the Center of an Object
16B	Compute Averages
16C	Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16D	Solve Problems, Combining All Processes Involving Units of Measurement
16E	Identify and Interpret Information From Charts, Number Lines, Scales, and Graphs, to Solve Arithmetic Problems
16F	Solve Conversion Problems
16G	Solve Problems Involving Ratio and Proportion
16H	Solve Word Problems Involving any Mathematical Process

PC SERIES: GRAPHING IN THE COORDINATE PLANE

17A	Identify Grid Coordinates on a Military Map
17B	Specify the 6 Digit Coordinates of any Intersection of Lines on a Military Map
17C	Plot a Point at an Intersection of a Grid When Distance and Direction are Specified
17D	Specify the 8 Digit Coordinates of any Intersection of Lines on a Military Map

PC SERIES: ALGEBRA

18A	Solve Simple Algebraic Equations with One Unknown

18B Derive Equivalent Algebraic Equations
18C Calculate Power and Square Root with the Aid of a Pocket Calculator and Use Formulas to Solve Problems

PC SERIES: TRIGONOMETRY

19A Use Tables of Trigonometric Functions (Mils)
19B Use Tables of Logarithms to Solve Multiplication and Division Problems
19C Use Trigonometric Functions to Solve Geometric Problems and to Calculate the Length of a Side of a Triangle
19D Use Tables of Trigonometric Functions (Degrees)

PC SERIES: PROCEDURAL DIRECTIONS

25A Follow Directions to Complete a Task Activity Which Involves Reading, Observation, Identification, and Comparison
25B Select Parts of Text and Visual Materials to Complete a Task Activity
25C Follow Highly-detailed, Step-by-step Directions in Order to Accomplish a Sequence of Task Activities
25D Determine the Essential Message (main idea) of Job-related Material
25E Select Appropriate Decision or Course of Action in a Specified Situation
25F Synthesize Information From Written and Oral Sources in Order to Complete a Task or Activity

PC SERIES: VOCABULARY

26A Recognize the Meaning of Common Words
26B Recognize the Meaning of Aircraft and Tank Related Words
26C Identify the Correct Meaning of a Word from the Context of a Sentence
26D Recognize the Meaning of Common Contractions, Abbreviations, and Acronyms
26E Determine the Meaning of Figurative and Idiomatic Terms
26F Recognize the Meaning of Communication and Navigation Related Words
26G Recognize the Meaning of Rifle and Survival Related Words

PC SERIES: REFERENCE SKILLS

27A Locate Documents by Code Number and Title
27B Locate and File Information Alphabetically and Alphanumerically
27C Locate Information in a Book or Manual by Using the Table of Contents, Index, Appendix, and Glossary

27D Locate the Title, Page, Paragraph, Figure, or Chart Needed to Answer a Question or to Solve a Problem
27E Skim or Scan for Relevant Information
27F Use Cross References to Locate Information
27G Organize Information from Multiple Sources

PC SERIES: TABLES/CHARTS

28A Obtain a Fact or Specification from a Two-Column Table or Chart
28B Obtain a Fact or Specification from an Intersection of a Row-by-column Table or Chart
28C Use a Complex Table or Chart Requiring Cross-referencing within the chart or in Combination with Text Material Outside the Chart
28D Use Information from Tables and Charts to Locate Malfunctions or Select a Course of Action

PC SERIES: ILLUSTRATIONS

29A Identify Details, Labels, Numbers, and Parts from an Illustration
29B Identify Details, Labels, Numbers, and Parts According to a Key, Legend, or List
29C Use a Cross-Sectional View of an Object for Decisions and Assembly or Disassembly
29D Use a Three-dimensional Projection or Exploded View of Objects to Perform an Action or Complete a Procedure
29E Use an Illustration or Sequence of Illustrations to Follow Directions
29F Integrate Visual Information from Various Sources to Select a Course of Action
29G Use a Map to Identify and Communicate Details of Terrain or Layout

PC SERIES: FLOW CHARTS

30A Identify the Meanings of Symbols on a Flow Chart
30B Use a Flow Chart to Make a Procedural Decision
30C Use a Chart to Identify Organization Members

PC SERIES: SCHEMATICS

31A Identify and Locate Subsystems of Block, Schematic, and Wiring Diagrams
31B Identify Components and Signal Paths of a Symbolic Configuration
31C Trace Circuit Connections from One Designated Point to Another Within a Schematic Diagram

31D Identify Possible Faulty Components of a Subsystem Using a Troubleshooting Table
31E Identify Symbols that Indicate Components, Signal Paths, and Test Points on a Schematic or Wiring Diagram

PC SERIES: FORMS

32A Locate the Block on a Form to Enter Appropriate Information
32B Transfer a Number, Code, Date, Figure, or Related Data, from Equipment or Written Sources, to an Appropriate Section of a Form
32C Write the Names of the Organization, Responsible Personnel, Disposition of the Part of Equipment, and Nomenclature in Appropriate Sections of a Form
32D Write a Descriptive Account of an Activity or Transaction Performed
32E Use a Completed Form to Locate or Compare Information

PC SERIES: NOTE-TAKING

33A Record Essential Information
33B Assure Accuracy and Precision When Recording Information
33C Record Information in Sentence Form
33D Record Information that Involves More Than One Sentence

PC SERIES: OUTLINING (topic or sentence)

34A Identify the Main Ideas in a Situation or Event
34B Recognize Titles for Each Section of the Outline
34C Select Appropriate Details to Support the Main Topic
34D Use Numbers and Letters to Label Topics in an Outline
34E Write a Training Outline

PC SERIES: REPORT WRITING

35A Identify the Objectives, Report Intent, Target Audience, and All Essential and Supporting Details of a Written Report
35B Summarize the Essential Details of a Report by Answering the Questions Who, What, When, Where, and How, as Appropriate
35C Select Relevant Details for a Written Report
35D Generate a Written Report, Arranging the Events Sequentially
35E State General Impressions of Events or Situations as They Relate to Specific Reporting Goals
35F Write a Report Including Necessary Support Documentation or Classification
35G Summarize Events and Precise Dialog in an Accurate, Complete, and Objective Manner
35H Summarize the Major Points Presented in a Written Report

35I Write a Report that Justifies Actions Taken, and that Provides Good Reasons for Rejecting Alternative Actions
35J Generate a Written Report According to a Specific Format

PC SERIES: EDITING

36A Spell Frequently-used Words Correctly
36B Spell Task-Related Words Correctly
36C Identify Words that Need to be Capitalized
36D Use a Reference Source to Correct Misspellings
36E Apply All Rules for Endmarks, Commas, and Apostrophes
36F Apply Common Rules of Grammar
36G Rewrite a Paragraph by Stating the Main Idea, Supporting Details, and Concluding Statement
36H Appraise a Written Communication and Make Adjustments to Improve Clarity

PC SERIES: PRECAUTIONS

40A Use Common Knowledge to Prevent Injury to People or Equipment
40B Apply Preventive Measures to Minimize Potential Safety or Security Problems
40C Identify Appropriate Course of Action in Specific Emergency Situations

PC SERIES: RECOGNITION

41A Identify and Label Objects by their Descriptive Name and Use
41B Use and Interpret Hand and Arm Signals
41C Identify Damage to, or Defects in, Equipment
41D Move, Aline, and Connect Objects
41E Identify Objects by Size, Shape, Color, and Markings
41G Use Sight, Hearing, and Touch to Determine a Course of Action
41H Interpret and Use Symbols and Codes

Civilian Occupational Title: ACCOUNTING CLERK
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Civilian Occupational Title: AUTO-BODY REPAIRER
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Civilian Occupational Title: BOOKKEEPER
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Civilian Occupational Title: CARPENTER
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Civilian Occupational Title: CLERK-TYPIST
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Civilian Occupational Title: COMPUTER OPERATOR
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Civilian Occupational Title: CORRECTIONS OFFICER

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Civilian Occupational Title: COSMETOLOGIST
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Civilian Occupational Title: ELECTRICIAN
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Civilian Occupational Title: ELECTRICAL ASSEMBLY TECHNICIAN
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Civilian Occupational Title: FIREFIGHTER
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Civilian Occupational Title: FLORAL DESIGNER
"=" - required by COT

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Civilian Occupational Title: HOME HEALTH AIDE
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Civilian Occupation Title: LICENSED PRACTICAL NURSE
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Civilian Occupation Title: MACHINIST
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Civilian Occupational Title: NURSE'S AIDE
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Civilian Occupational Title: PLUMBER
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Civilian Occupation Title: POLICE OFFICER
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41d=
41e=
41g=
41h=

Civilian Occupational Title: RECORD KEEPER

"=" - required by COT

01a=
01b=
01c=
01d=
01e=
01f=
01g=
01h=
01i
02a=
02b=
02c=
02d=
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Civilian Occupational Title: WORD PROCESSOR
"=" - required by COT

01a=
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41h=

APPENDIX E

Lessons from JSEP curriculum have been matched to civilian occupational titles to form draft prescriptions. The individual lessons were then tallied in order of frequency of appearance in draft civilian prescriptions. This section reveals, for example, that 12 lesson titles appear in 19 of the draft prescriptions, and that 9 titles appear in 18 prescriptions, and so on. Note that the lesson codes used here are tied to the lesson titles presented at the beginning of Appendix D, and that each of these titles usually represents two lessons — the Diagnostic Review Lesson and the Skill Development Lesson. This arrangement of lesson titles in decending order of frequency of appearance allows an effective means of prioritizing the adaptation of the curriculum.

Appendix E: CIVILIAN CURRICULUM

19) 1h
11a
12a
12b
12c
13a
13b
25b
25d
28a
28b
29e

18) 1c
14b
14d
27a
27c
27e
32a
32e
41e

17) 25a
25c

16) 1a
1d
6a
6b
8e
10a
11b
27b
27d
27f
29g
33b

15) 28d
30a
40b
41a

14) 1b
2a
4d
12d
26d
26f
26g
29a
32b
40a
41d

13) 2g
4a
4c
28c
32c
41g

12) 1e
5a
26e
29b
32d
33a

11) 1g
5b
13c
14f
40c
41h
41c

10) 2b
2c
4b
5d
15b
26a
36f

9) 1f
3a
5c
5f
5g
5h
14e
25e
31a
35a
35b
35d
35e
35i
36a
36e

8) 12g
14a
29c
29d
35c
35f
35h
36c
41b

7) 36h
8b
25f
13d
9a
31b
27g
7b
7e

6) 2d
3b
5e
12f
15a
15f
16g
17a
16c
36d
29f

5) 5i
6c
7a
12h
16b
16c
16f
17b
18a
31c
35j

4) 1i
3c
3d
7c
8a
15c
15h
15j

3) 2e
4e
6d
8c
9b
14g
15g
16d
16h
18c
30b

2) 2f
7d
14c
15d
15i
16e
18b
30c
31d
31e
33c
34d
34c

1) 4f
8d
9e
9d
12e
13e
19a
33d
34b
36g
35g
34d

0) 9c
15e
16a
17c
17d
19b
19c
19d
26b
34e
34a

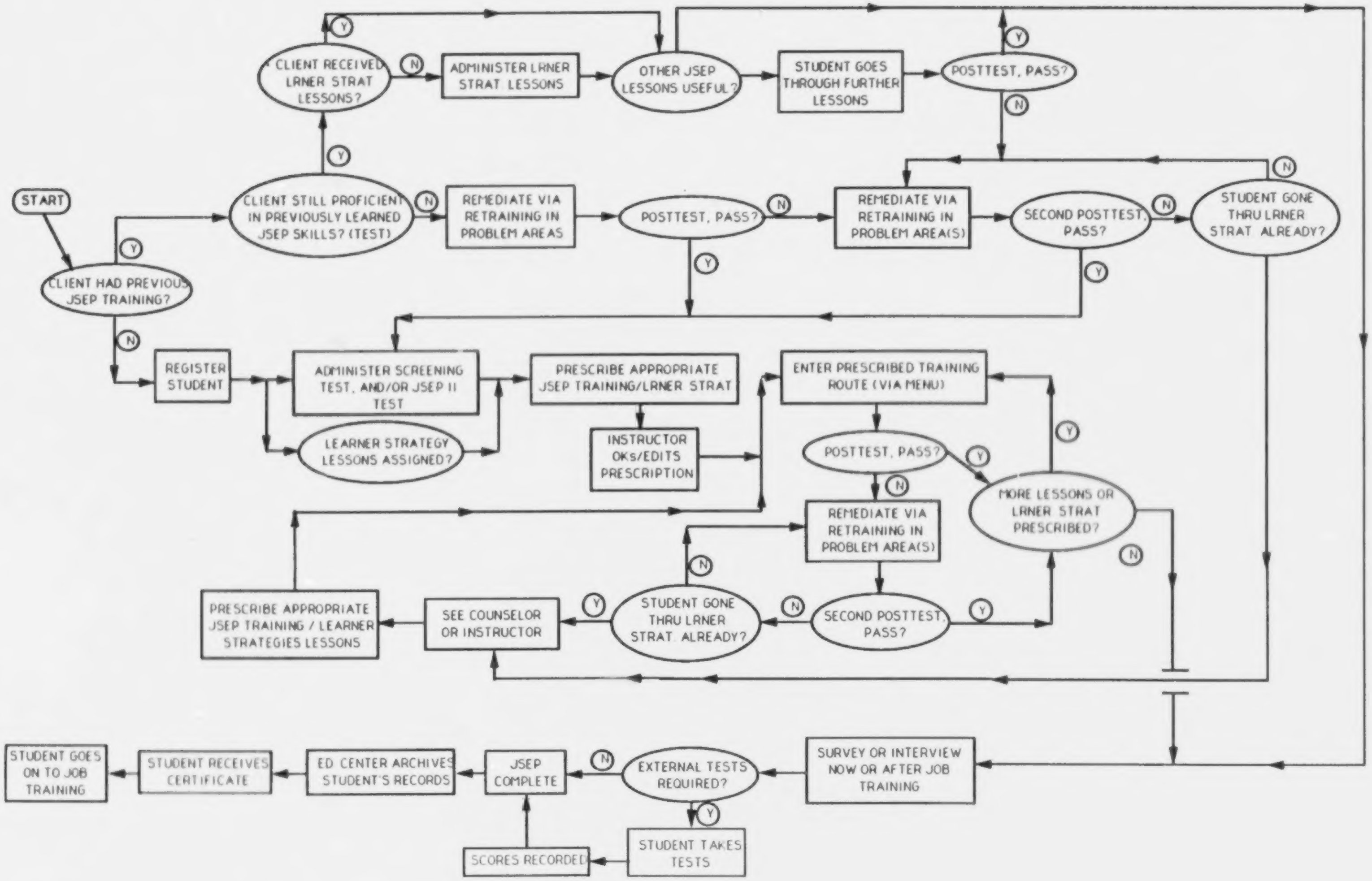
APPENDIX F

The Civilian JSEP Implementation Handbook (to be produced during Phase II of the project) will contain models of how the Civilian JSEP might be incorporated into existing employment, training, and adult education programs. This section offers diagrams of how the program might be used in three basic situations: (a) A client is at risk of dropping out of training because of basic skill deficiencies, (b) a client is unable (or unqualified) to begin job training in the first place due to basic skills deficiencies, and (c) the job training options available to a client are restricted due to basic skills deficiencies.

Appendix F

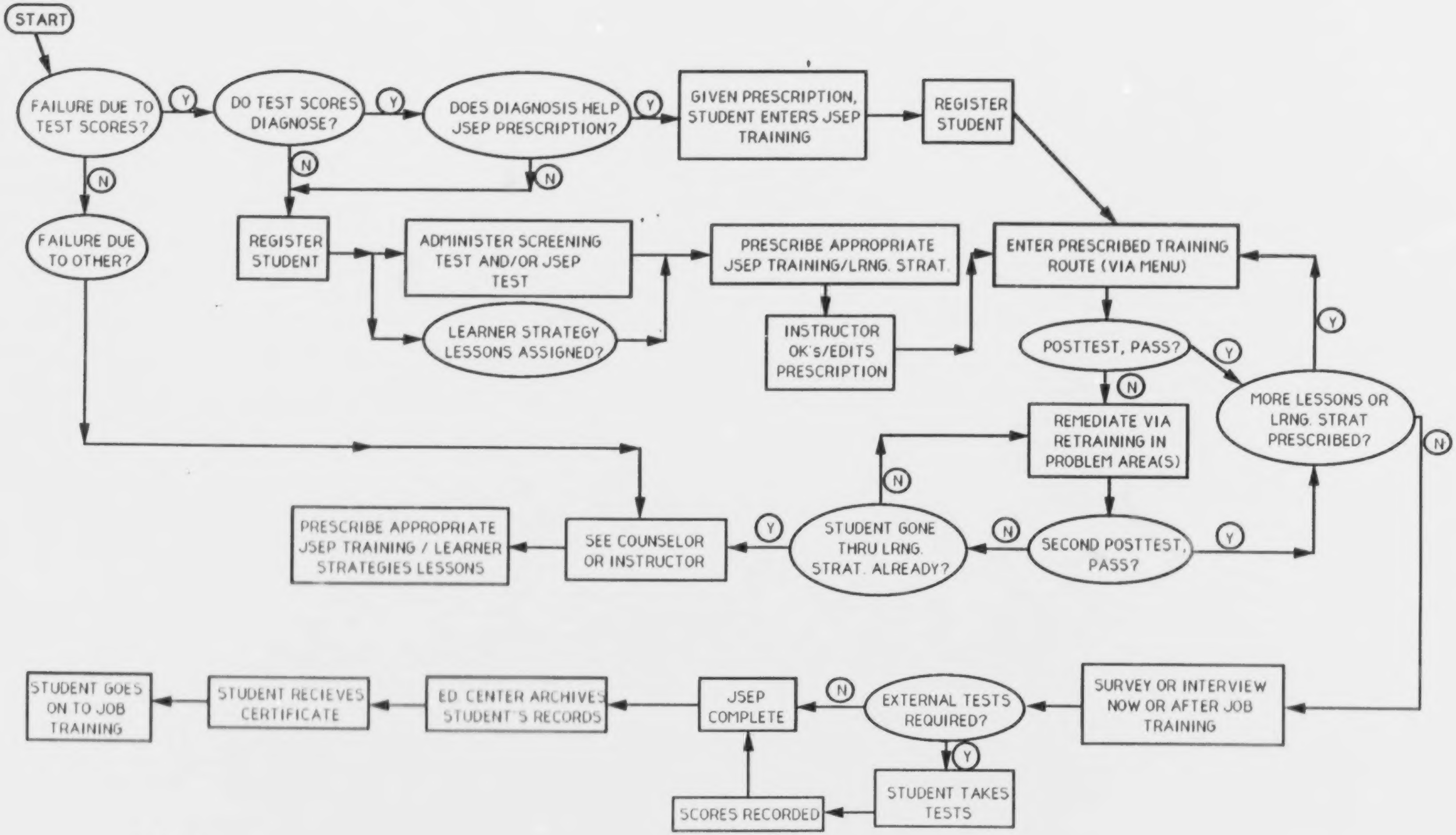
A

Client at Risk of Dropping-out of Training


START
CLIENT HAD PREVIOUS JSEP TRAINING?
Y
N
REGISTER STUDENT
CLIENT STILL PROFICIENT IN PREVIOUSLY LEARNED JSEP SKILLS? (TEST)
CLIENT RECEIVED LRNER STRAT LESSONS?
ADMINISTER LRNER STRAT LESSONS
OTHER JSEP LESSONS USEFUL?
STUDENT GOES THROUGH FURTHER LESSONS
POSTTEST, PASS?
REMEDIATE VIA RETRAINING IN PROBLEM AREAS
POSTTEST, PASS?
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
STUDENT GONE THRU LRNER STRAT ALREADY?
ADMINISTER SCREENING TEST, AND/OR JSEP II TEST
LEARNER STRATEGY LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNER STRAT
INSTRUCTOR OKs/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
MORE LESSONS OR LRNER STRAT PRESCRIBED?
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
STUDENT GONE THRU LRNER STRAT. ALREADY?
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECEIVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

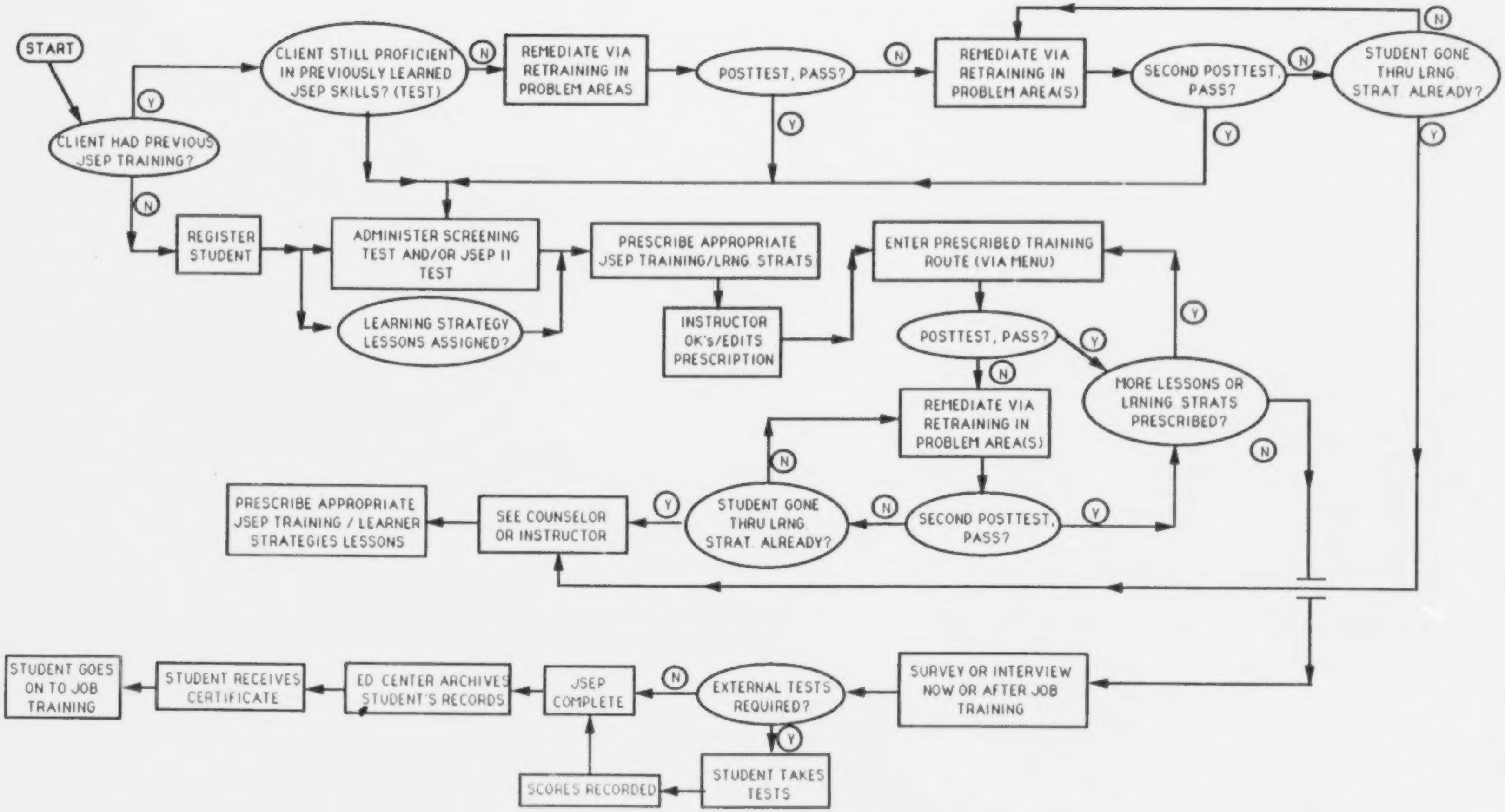
B

Client Unable to Begin Job Training w/o Remediation via JSEP


START
FAILURE DUE TO TEST SCORES?
Y
N
DO TEST SCORES DIAGNOSE?
Y
N
DOES DIAGNOSIS HELP JSEP PRESCRIPTION?
Y
N
GIVEN PRESCRIPTION, STUDENT ENTERS JSEP TRAINING
REGISTER STUDENT
FAILURE DUE TO OTHER?
REGISTER STUDENT
ADMINISTER SCREENING TEST AND/OR JSEP TEST
LEARNER STRATEGY LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNG. STRAT.
INSTRUCTOR OK's/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
Y
N
MORE LESSONS OR LRNG. STRAT PRESCRIBED?
Y
N
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
Y
N
STUDENT GONE THRU LRNG. STRAT. ALREADY?
Y
N
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
N
Y
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECIEVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

C

Increasing Client Options Through JSEP Training


START
CLIENT HAD PREVIOUS JSEP TRAINING?
Y
N
CLIENT STILL PROFICIENT IN PREVIOUSLY LEARNED JSEP SKILLS? (TEST)
N
REMEDIATE VIA RETRAINING IN PROBLEM AREAS
POSTTEST, PASS?
N
Y
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
N
Y
STUDENT GONE THRU LRNG. STRAT. ALREADY?
N
Y
REGISTER STUDENT
ADMINISTER SCREENING TEST AND/OR JSEP II TEST
LEARNING STRATEGY LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNG. STRATS
INSTRUCTOR OK's/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
Y
N
MORE LESSONS OR LRNING. STRATS PRESCRIBED?
Y
N
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
Y
N
STUDENT GONE THRU LRNG. STRAT. ALREADY?
N
Y
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
N
Y
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED. CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECEIVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

VOLUME II

TASKS 15 - 22
DISCUSSION

CENTER FOR
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TECHNOLOGY
FLORIDA STATE UNIVERSITY

FORD AEROSPACE CORPORATION

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Task 15 - FIAG Briefing

On September 7, 1988, a briefing was held in Washington, D.C. to update members of the FIAG committee on the progress of the project. Major points covered included:

1. An overview of the project and a summary of tasks completed to date, including decisions being made concerning these tasks;

2. A description of remaining tasks, and plans for these tasks;

3. A discussion of degreening guidelines and adaptation plans.

Attendees at the FIAG conference included: David Dick, Robert Branson, Col. W.A. Bradley, Lester Orech, Joyce Winterton, Ron Pugsley, Zita Simutis, Jerry Gunderson, Bill Delaney, Robert Miller, Joyce Cook, Tom Litkowske, Lois Wilson, and Karl Haigler.

Task 16 - Adaptation of JSEP for Pilot Test Use

The adaptation of JSEP encompassed the following three parts: The JSEP Common Test, the JSEP lessons (long, short, and paper), and JSEP Instructor Training and management system materials.

The JSEP Common Test was adapted from the Army-JSEP version of the JSEP Test II. An item analysis was employed to cull the items providing maximal discrimination. Gaps in lesson representation in the test were filled. The remaining items were degreened and organized into the JSEP Common Test. Length was determined by the desire for a test requiring less than one hour to administer.

The JSEP computer lessons underwent a multi-stage degreening process. First, an instructional designer reviewed a lesson, generating a change order detailing all alterations to be made.

These change orders were then approved or modified by the project manager. After proposed changes were approved, they were given to programmers for on line revision. Once the programming was complete, the designer reviewed the degreened lesson, ensuring the appropriate changes had been made. JSEP paper lessons underwent a similar process of revision and quality inspection.

JSEP Instructor Training and management system materials were reviewed by an instructional designer for "greenness" and instructional soundness. Appropriate degreening and pertinent changes to these materials were initiated at this time. These activities are discussed further in the descriptions of Tasks 19 and 30.

Task 17 - Site Selection

The pilot site choice was made after meeting with members of the TAG. Considerations at this meeting included:

1. Presence of target populations, such as
    a. dislocated workers
    b. long-term unemployed
    c. welfare recipients
    d. displaced homemakers
    e. educationally disadvantaged adults and youth with the JTPA, and,
    f. adult vocational education populations;

2. Availability of a minimum of 200 potential JSEP students in the pilot test program;

3. Willingness on the part of the local JTPA administrative agency to participate in the pilot test;

4. The inclusion of (at a minimum):
    a. One JTPA location,
    b. One vocational education location, and

c. One adult education location;

5. Availability of appropriate computer facility and hardware; and

6. Proximity to FSU-Ford to minimize travel costs.

FSU-Ford presented the Rochambeau School in White Plains, New York as its choice to be the pilot JSEP site. This choice was approved by the TAG. Rochambeau School serves approximately 2600 students from a variety of ethnic backgrounds including: American Indian/Alaskan, Hispanic, Asian/Pacific Islands, Black, and Other. These are ABE's (American Basic Education), ESL's (English as a Second Language), GED's (General Equivalency Diploma), and JTPA (Job Training Partnership Act) students.

The White Plains site was chosen because it afforded the most attractive of compromises in terms of site requirements. The area population is large (pop. 50,000), and in a suburban environment with an average income of about $35,000 a year. JTPA was active in the area and expressed a willingness to participate, and the on-site facilities lent themselves to JSEP installation. Both state and school officials were exceptionally helpful throughout the selection process.

Task 18 - Evaluation of Pilot Test Plan

The pilot test plan addressed an approach for assessing the pilot test and included both process and outcome/cost measures. The plan was subject to both COTR and TAG approval.

The primary goals of the pilot test were as follows:

1. Establishing effectiveness of the JSEP curriculum with civilian adult students;

2. Determining the minimum amount of degreening adaptation necessary for sucessful civilian application of the program; and,

3. Collecting cost data that can be integrated with performance outcomes to allow comparison with conventional programs.

Evaluation of these goals has been accomplished by the collection of data at specified points before, during, and after the pilot test using several types of collection techniques and instruments.

Task 19 - Dissemination Plan for Phase Two of Project

The dissemination plan is the framework for the diffusion of information concerning JSEP. It involved the following:

1. A JSEP Implementation Handbook was developed, containing information and ideas for JSEP practioners to ease the implementation process. This 200 page manual has been evaluated with instructors and has been reviewed and approved by the TAG and COTR. The Implementation Handbook contains:
    a. A program description
    b. JSEP instructor requirements and responsibilities
    c. JSEP lesson descriptions
    d. System hardware operations overview
    e. Courseware operations overview
    f. TICCIT keyboard description.

2. A brochure was created outlining availability, technical assistance, and sources of further information concerning JSEP. This brochure was reviewed and approved by the TAG and COTR.

3. Conference attendance, articles and the presentation of papers have all been used to help disseminate information about JSEP during and after the pilot test.

4. Strategies and methodologies for continued civilian distribution have been drawn up, resulting in practical and comprehensive methods for JSEP's dissemination.

Task 20 - Final Pilot Test Plan Developed

The final pilot test plan was developed addressing four general guidelines: The adaptation of JSEP, site location, evaluation approaches, and the duration of the pilot test.

Included in the pilot test plan were the results of Task 16 (Adaptation of JSEP), Task 17 (Site selection), Task 18 (Evaluation of test plan), and parts of Task 19 (Dissemination plan). This information was organized into a week by week plan of the pilot test of JSEP. The test plan was approved by COTR and TAG.

Task 21 - Negotiate Agreements to Provide Technical Assistance to the Three ETA-selected States

The three ETA selected states were California, Delaware, and Indiana. A five step approach was developed to provide assistance to these states. The first three steps were identical for each state. The last two steps were individualized according to the states' differences in requirements for levels and kinds of support.

Step 1: A meeting was conducted at Florida State University Feburary 22-23, 1989. This meeting consisted of an introductory briefing on JSEP along with a JSEP demonstration and a tour of the Center for Educational Technology. Also covered at this meeting were the steps required by each state to implement JSEP and a session to begin each state's JSEP implemention plan.

Step 2: Representatives from each state were asked to attend an on-site meeting June 22, 1989 at the White Plains pilot site to observe a JSEP class in session, a JSEP instructor briefing, and to participate in a working session to revise and refine the JSEP implementation plan for their state. This gathering was scheduled to coincide with a TAG meeting.

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Step 3: This step called for the three states to submit their own JSEP implementation plans to FSU for review and assistance.

Step 4: FSU-Ford would visit each of the states to generate equipment and support proposals.

Step 5: This step called for a second visit to each state by FSU-Ford after JSEP had been installed to provide additional training and further assistance.

For a more detailed summary of efforts relative to participation by the demonstration states see the Technical Assistance Report in Volume 3 (pp. 17-20).

Task 22 - Conduct On-site Pilot Test

The pilot test began June 22, 1989 and was completed December 14, 1989. Prior to the pilot test, on May 22-26, 1989, Ford trained White Plains personnel in "power up/down" activities and standard maintenence of the hardware, and other system operation concerns.

The first week of implementation was spent selecting students, setting up the MicroTICCIT computer system, and conducting JSEP Instructor training. Students were chosen from existent classes at the Rochambeau School.

MicroTICCIT hardware and JSEP courseware was installed at this time, with participation from the White Plains staff to familiarize themselves with the equipment and courseware.

Instructor training was conducted by FSU, June 5-7, 1989, covering JSEP program administration, operations, andmanagement. These activities were followed by a week-long trial run of the system. Debugging and information gathering was accomplished at this time.

The JSEP ribbon-cutting was June 23, 1989. This open house hosted by White Plains demonstrated JSEP to community leaders and client organizations. Selected attendees at this assembly were: David Dick, Robert Branson, Beatrice Farr, J.D. Miller, Andrew Morzello, Ann Serrao, Sylvia McCollum, Warren Rucker, Tony Sarmiento, Kim Fareri, Michael Mooney, Paul Geib, Jerry Spurlin, and Lois Wilson.

Students were registered, lesson prescriptions were created, and lessons were begun.

During the mid-term evaluation, information and data were received by FSU from White Plains, and was examined. Programmers then made appropriate changes to the system courseware. 135 lessons were revised by this process; 800 graphics in 49 lessons were modified. The FSU staff spent approximately 300 hours revising JSEP materials.

Problems fell into two categories: System problems and courseware problems. The two dominant system problems were difficulties in the accuracy of student progress reporting, and problems with the test log reports.

Courseware problems also fell into two categories: Typographical errors and bugs in the lesson code. Each problem was corrected as it was detected. A revised release of the courseware was installed at the site in January of 1990.

VOLUME III

PROCDURE AND IMPLEMENTATION OVERVIEW

CENTER FOR
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FLORIDA STATE UNIVERSITY

Ford
FORD AEROSPACE CORPORATION

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Methods and Procedures

Introduction

The Job Skills Education Program (JSEP) represents the first major adaption of computer-based instruction developed expressly for a military instruction environment to civilian use. JSEP was originally created for the U.S. Army. It was perceived by the Department of Education and the Department of Labor as compatible with their own mission goals and training problems. However, a review of the literature revealed no established methods or procedures to guide this type of military to civilian transfer process.

The method used here is best described as a systematic analysis that reduced the overall transfer process to a series of major events. Each of these tasks was then divided into operations or procedures designed to achieve the related event. The following discussion describes these events and provides the level of detail necessary to understand the overall process.

Review and Planning Procedure

The project was initiated with the formation of a Technical Advisory Group (TAG) to offer advice on all project tasks. The TAG was consulted regularly throughout the project, as well at key project decision points. The TAG consisted of representatives of the Federal Departments of Education, Labor, Defense, Justice, and state and national leaders in adult and vocational education.

A literature search and subject interviews were conducted to discover other examples of military material that had been made available for civilian use. This was done to learn more about the technical transfer process of Army information to civilian use. It also determined if any of these procedures could be adopted by the JSEP project to expediate its tasks. The results of this effort are described in the JSEP Literature Reviews, Interviews and Summary Report submitted to the DOE Office Vocational Adult Education. In brief, no appropriate guidelines of procedures were uncovered.

Following initial meetings and reviews a procedure was developed for relating JSEP lessons to civilian occupations and consisted of the following steps:

1. A review of the NOICC Crosswalk/Crosscode with specific attention to the 94 Military Occupational Specialties (MOS) from which prerequisite competencies for the JSEP lessons were derived. This review also identified MOS titles that matched the civilian Dictionary of Occupational Titles (DOT);

2. A review of the Army Research Institute materials that related prerequisite competencies to specific MOSs;

3. A review of the RCA job-task analysis of the the Army version of JSEP;

4. Matching prerequisite competencies (PC) to civilian occupations by comparing MOSs to Civilian Occupational Titles (COT);

5. Identifying civilian jobs having no Army equivalent using the Training Emphasis Rating Scale.

The result was a PC to MOS matrix that displayed 180 civilian occupational titles (COT) corresponding to 94 MOS titles. Occupations that had only military application were removed from this list reducing the count to 125 civilian occupations.

Review Results

Twenty DOT occupations were selected from this list as candidates for the pilot study in Phase II of the project. These occupations were chosen from the COT as determined by the process described above.

The COTs were selected using several criteria. A candidate COT had to be in a growth field, match JSEP MOSs, have a high number of JTPA and Adult Vocational Education participants, and have appropriate students available at the pilot test site. The 20 occupations chosen were:

1. Accounting Clerk
2. Auto-body Repairer
3. Bookkeeper
4. Carpenter
5. Clerk-typist
6. Computer Operator
7. Corrections Officer
8. Cosmetologist
9. Electrician
10. Electrical Assembly Technician
11. Firefighter
12. Floral Designer

13. Home Health Aide
14. Licensed Practical Nurse
15. Machinist
16. Nurse's Aide
17. Plumber
18. Police Officer
19. Record Keeper
20. Word Processor.

A prescription for each of the 20 chosen occupations was generated. A prescription is a list of the JSEP lessons to be completed by the students to fulfill the prerequisite competencies for a particular occupation.

Guidelines for the minimum amount and types of degreening for optimal comprehension by the target audience were established. The appropriate amount of degreening for the pilot test of the JSEP materials was determined at this time. These guidelines were applied to all JSEP materials throughout the degreening process. These degreening guidelines were:

1. Remove or adapt military context references with no civilian equivalents;
2. Convert all military spellings to civilian spellings;
3. Remove acronyms where possible;
4. Convert military ranks to generic, civilian terms;
5. Replace military jargon with more familiar expressions;
6. Change graphics and illustrations only when they might confuse civilian students or when changes in text require corresponding changes in graphics; and,

7. Lower the readability level of the text where possible.

Student Screening and Measurement Instruments

The Reading and Mathematics sections of the Test of Adult Basic Education (TABE) were used to determine reading and mathematics levels of potential JSEP students.

A six-step process was used to revise the criterion referenced tests (JSEP Common test) and included the following activities:

1. Selecting the Army JSEP instruments to be adapted;
2. Matching test items with their respective lessons;
3. Retaining items testing a maximum number of lessons;
4. Discarding items with military content;
5. Degreening the remaining items.

The Army versions of the JSEP Diagnostic Review Lesson tests and the JSEP II Test were reviewed for applicability. Likewise, all JSEP components were reviewed for adaptation to Job Training Partnership Act (JTPA) and Adult Vocational Education populations. Key issues here were literacy level of the learners and how JSEP might fit JTPA and Adult Vocational Education program structures in various states. Special needs of these populations were also considered in making additional changes to the JSEP curriculum.

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Student Management System

The JSEP computer-based Student Management System (SMS) was evaluated to determine changes required to adapt it for civilian use. This evaluation specifically examined:

1. Creation of new prescriptions and required programming;
2. Allowing the JSEP instructor to modify the programmed prescriptions.

Pilot Test Plan

A preliminary pilot test plan was developed. This plan included implementation overview, potential sites, delivery system specifications, staffing requirements, and evaluation procedures. A final pilot test plan was then drawn up that addressed the following issues:

1. Adapting JSEP materials for civilian use;
2. Site location choice;
3. Evaluation approaches;
4. Duration of the pilot test;
5. Staffing and hiring instructors at the pilot test site;
6. Administrative arrangements.

The evaluation plan test was developed and carried out at the pilot test's conclusion. This included outcome and cost measures with three evaluation levels. The first was a benchmark to compare JSEP against stated specifications. The second included specific formative evaluation concerns. The third was project summative evaluation.

Courseware Adaptation Procedures

Following the above steps, JSEP courseware was adapted for civilian use. JSEP courseware is both paper-based and computer-based. Consequently different but equivalent procedures for degreening each type of material were used.

The computer based lessons (the SDLs, Skill Diagnostic Lessons, and DRLs, and the Diagnostic Review Lessons-see Volume IV, the JSEP Implementation Handbook p. 3-2 for a description of lesson formats) underwent a multi-stage review and revision process. First, an instructional designer reviewed a lesson, generating a change order detailing all alterations to be made. These change orders were then approved or modified by the project manager. After the proposed changes were approved, programmers made on-line revisions. The designer then reviewed the degreened lesson, ensuring that the appropriate changes had been made.

The paper-based lessons and workbooks (designed for use with some of the computer based lessons) underwent a similar degreening process, both in revision procedures and quality inspection.

Pilot Test Site Preparations

The Rochambeau School at White Plains, NY was selected as the site for the pilot test. Criteria for selecting this site included technical, social, physical, and political factors. Facilities and equipment available on-site were also major considerations.

Following hardware procurement at the test *site, the selected* instructors received a comprehensive, 40-hour training course, students were selected, and the JSEP Common Test and the TABE were administered to the participants. Pertinent student biographical information was also collected.

Once these preliminary JSEP procedures were complete, the students began taking the lessons prescribed to them. When the students completed their prescription, the JSEP Common Test and the TABE were administered again to determine achievement gain.

Computer System Components

Hardware delivered to White Plains for on-site installation included two MicroTICCIT hosts with the following configuration:

1. MicroTICCIT AT 286 with 1 MB of RAM;
2. 338 MB hard drive;
3. 60 MB drive tape backup;
4. Local area network card;
5. Color monitor, keyboard, light pen, and cables.

Thirty-six MicroTICCIT student workstations with the following configuration:

1. MicroTICCIT workstation, with 256 KB of RAM;
2. Local area network card;
3. Color monitor, keyboard, light pen, and cables.

Software

Software delivered to White Plains for on-site installation included:

1. TICCIT Operating System;
2. JSEP Courseware.

Project Documentation

A series of handbooks and reports was created during the course of the project. Each document went through a detailed review process by CET, Ford Aerospace, ED-COTR, the U.S. Department of the Army, and the TAG. The documents include:

1. Literature Reviews, Interviews, and Summary Report;
2. Phase I Technical Report;
3. Final Dissemination Plan;
4. JSEP Implementation Handbook;
5. JSEP Informational Brochure;
6. Final Technical Report;
7. Technical Assistance Report;
8. JSEP Pilot Test Report.

Final Briefing

CET-Ford held a final debriefing session with federal and state officials to disseminate the final results of the pilot study test.

Results

This section describes outcomes from five distinct but related areas of the JSEP project. First, results deriving from the methods and procedures that CET and Ford used to plan and implement JSEP are presented. Second, student experiences with JSEP are described. These include learning outcomes in the form of gain scores with references to relevant statistical data and a summary of student attitudes toward JSEP. Third, the discussion deals with how the personnel at the pilot test site reacted to JSEP and CBI. This includes issues such as administrator and instructor reaction to JSEP and CBI, level of client satisfaction, and prospects for continuing use. Fourth, the discussion considers the effects arising from residual "greenness" in the JSEP curriculum. Fifth, issues of ease of using the MicroTICCIT system are raised.

1. The CET-FSU transfer-implementation model worked successfully. The discussion above has already mentioned that this project was a unique attempt to transfer computer-based instruction across workplace and "cultural" boundaries. The methods and procedures used to achieve project goals were unique as well. However, the model's success lies in the systematic application of instructional design principles throughout the project. As a result, the process that CET and Ford created to carry out this transfer has excellent potential for use in similar, future projects.

2. Students experienced high levels of academic success in JSEP. As part of the initial enrollment process, all JSEP students took two tests, the

JSEP pretest and the Test of Adult Basic Education (TABE). After students completed their JSEP course of instruction they took the JSEP Common Test as a posttest, the same test they had taken before beginning instruction. Students also took the TABE again at this time.

Students showed significant gains on both tests. A full description and discussion of these test results appears in Volume V, the JSEP Pilot Test Report. In brief, however, posttest scores show an increase of 34% over pretest scores. TABE results show an increase of 1.26 grade levels in reading and .94 grade levels for mathematics, impressive increases by any measure.

These academic results indicate high levels of instructional effectiveness and efficiency. The accompanying affective measures--how the students felt about their JSEP experience--are equally impressive. Questionnaire responses showed that students liked JSEP instruction, felt motivated to learn, wanted to learn more, and perhaps most important, felt at ease with the computer. They also reported that the lessons were appropriate to their needs and were at an appropriate level of difficulty both in reading and content. Again, a full report of these results appears in Volume V.

3. Administrative and instructional staff at the pilot test site reacted positively to JSEP and CBI. An important effect that the staff attributed directly to JSEP was an increase in student retention rates at the training center. Instructors reported students commenting that JSEP was the reason they had enrolled in the training program. Likewise, by the end of

the pilot test period, instructors indicated their acceptance JSEP by treating it as an integral part of the overall instructional system, rather than a "stand alone" curriculum.

4. Reactions to the level of greenness varied from the instructional staff to the students. Instructors reported that they thought the lessons needed further "civilianizing." That is, they felt that the curriculum was still too obviously military in its origins. In contrast, students reported that although they noticed the residual military artifacts in the lessons, the level of "greenness" present in the materials did not bother them.

5. In general, instructors and students found the MicroTICCIT system easy to use. Responses from student questionnaires show that students had few problems in finding their way around the system. However, instructors reported that they found the Student Management System (SMS) difficult to use. Specifically, they cited generating student reports and creating student instructional prescriptions as two functions that were especially difficult to manipulate.

Conclusions

Results from the pilot test support three firm conclusions. The first is that the CET-Ford dissemination-implementation model worked as designed. Beginning with the initial instructional task and curriculum analyses and concluding with the actual pilot test, the model provided an empirical framework for designing the procedures that supported the phases of the study that followed. As a result, the process that CET and

Ford created to carry out this transfer has excellent potential for use in similar, future projects.

The second conclusion relates to establishing a tolerable level of greenness. The CET-developed guidelines for degreening, appearing elsewhere in this volume, proved to be an excellent toolset for accomplishing this task.

Third, beyond expressing satisfaction with the JSEP curriculum, students showed high levels of interest in JSEP's computing aspects. Generally, students reported that in many cases they preferred computer-based instruction over the more conventional instructor-led instruction to which they were accustomed. This enthusiasm for using the computer clearly influenced the students' motivation to learn (reported in Volume V, JSEP Pilot Test Report) and should be seen as a major outcome of the study.

Recommendations

Several suggestions for future JSEP development and application appear in Volume V, the JSEP Pilot Test Report. These address possibilities concerning further degreening of the curriculum, expanding the JSEP curriculum content, implementing JSEP in high school settings, and implementing JSEP in the workplace. In addition, the following recommendations are offered as a guide to future JSEP development and dissemination efforts.

1. The process that CET-Ford used to implement and disseminate JSEP is a replicable model that is suitable for projects requiring transfer of educational technologies, especially from military to civilian environments. What CET has called "degreening" is really a subprocess of the larger model, one that an instructional design team can use to:

a. Determine the critical features of instruction; and,
b. Ensure greater client acceptance of the instructional product.

2. JSEP seems particularly useful to organizations encountering difficulty in upgrading worker skills so they can continue with more advanced levels of training. The retain and train issue is one that U.S. employers must confront squarely to compete successfully in the volatile economic conditions of the contemporary marketplace. At least two possibilities exist here. First, new employees could be tracked into JSEP as part of new employee orientation and training. Second, incumbent employees could be cycled through JSEP to increase their potential for advanced training.

3. Results from the pilot test show that JSEP instruction is inherently motivating. Consequently, organizations experiencing high employee turnover rates may find that this type of instruction provides a motivational antidote to feelings of employee disenfranchisement and discontent.

4. A program such as JSEP deserves to enjoy greater public access. To this end JSEP has a role, possibly a definitive one, in the area of non-

formal adult education. The logical facility for implementing such a program would be the local public library. This application is especially inviting since the hardware required to run JSEP is no longer proprietary: The system is now accessible and affordable.

5. This study has established the feasibility of transferring an educational technology from a military source to a civilian user population. During this process project staff encountered the same problems as technically advanced countries attempting to transfer various technologies to developing countries. Thus, the JSEP pilot test parallels and, to some extent, duplicates the experiences of agencies such as AID and WHO. Wide dissemination of the JSEP Pilot study results would increase awareness of implementation problems and solutions in other technology transfer projects.

6. Finally, a follow-up study at the Rochambeau School is highly desirable. As of this writing, clients have been using JSEP for nearly a year. Anecdotal evidence shows continued high levels of client satisfaction and student achievement. Such a study would provide longitudinal data that would reveal reasons for the successes of the program as well as the causes of the failures.

Technical Assistance Report

The Job Skills Education Program

Task 23 of the U.S. Department of Education (DOE) contract VN88003501, "Using the Job Skills Education Program to Prepare Adults for Vocational or Job Specific Training Programs," required the contract team of Florida State University and Ford Aerospace Corporation (FSU-Ford) to provide technical assistance to three states selected by the U.S. Department of Labor's Employment and Training Administration (ETA). This assistance would be in accordance with approved agreements negotiated in Task 21. FSU-Ford would assist the three states in implementing JSEP. Technical assistance would also include review of contractor-developed implementation materials and adapting the implementation process to each state's individual plan.

ETA awarded three separate grants to the states of Indiana (Indiana Department of Employment and Training Services, grant number 99-8-3442-98-099-02), Delaware (Delaware Department of Labor, grant number 99-8-3443-98-010-02), and California (California Department of Education, grant number 99-8-3444-98-011-02). These grants were distributed under the title "State Participation in Job Skills Education Program Technology," and each was worth $10,000.

ETA distributed the funds before DOE actually awarded the JSEP contract to FSU-Ford. Consequently, FSU-Ford met with Indiana, Delaware, and California to begin negotiations only after the participating states had already received their grants. The first contact between FSU-Ford project staff and representatives from the participating states occurred at the JSEP Technical Advisory Group (TAG) meeting on July 12, 1988, in Reston, Virginia. FSU-Ford briefed the TAG on project plans and demonstrated the JSEP program on the MicroTICCIT computer system.

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After the first TAG meeting FSU-Ford developed and carried out a five-step Technical Assistance (TAP) plan to support the ETA-sponsored states in implementing JSEP:

Step 1. FSU-Ford meets with the state representatives and DOE's Contracting Officer's Technical Representative.

This meeting took place in Tallahassee, Florida, on February 22-23, 1989. Major points in the discussions included:

- Describing a consortium model for implementing JSEP, including various partnership arrangements possible;
- Developing steps for JSEP implementation planning including equipment and site selection, staffing requirements, recommended support, and training; and,
- Sponsoring a "hands on" planning session to develop individual implementation plans.

At the close of the meeting each representative received a draft copy of the Implementation Handbook for review with the request for suggested revisions and additions.

Step 2. FSU-Ford conduct a TAG meeting at the operational JSEP pilot test site.

The second TAG meeting was held at Rochambeau School, White Plains, New York on June 22-23, 1989. Rochambeau School staff briefed TAG members on implementation activities and made recommendations for further effective implementation. TAG members also had the opportunity to observe JSEP students working at the computers and to talk with instructors and students in the program. A working session to revise and refine the states' individual JSEP implementation plans was also scheduled for this meeting.

Step 3. Participating states submit their final JSEP implementation plans to FSU-Ford for review. The documents are reviewed and returned with suggested revisions.

Step 4. FSU-Ford visit each JSEP site to assist in the actual implementation using the revised implementation plans.

Sites are inspected for suitability for JSEP implementation. Equipment and support are provided to each state according to individual plans and requirements. Instructors and administrators are briefed about the program, and final operating schedules are confirmed.

Step 5. FSU-Ford visit each JSEP site to train instructional and technical staff in JSEP operations.

FSU-Ford carry out classroom observations to identify operating problems at all levels of the implementation process. Recommendations for any changes are made and assistance is provided to effect necessary revisions.

Summary

FSU-Ford developed a TAP that complied with the guidelines provided in Task 23. This plan was fully suitable for the present project. Furthermore, the TAP retains the potential for application in future projects facing implementation challenges similar to those FSU-Ford encountered in JSEP.

FSU-Ford's experience with the JSEP implementation process however, shows that areas of misunderstanding allowed only a partially successful implementation of the TAP.

The participating states had an incomplete understanding of JSEP's technical and financial requirements. State representatives indicated that their applications for the ETA-grants were predicated upon the (false) understanding that the JSEP courseware could be stored on floppy disks

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and executed on standard PCs. It was not until the contract administered by the U.S. Department of Education had begun that the states became aware that the civilian JSEP courseware operates in the MicroTICCIT environment, and that operating the program would necessitate acquiring the MicroTICCIT delivery system. The state representatives had not anticipated the cost of new equipment. Consequently, they withdrew from the implementation process after Step 2 in the Technical Assistance Plan.

FSU-Ford could have clarified the states' understanding of JSEP's requirements if closer liaison had existed among the participants before the award of the ETA grants.

The sequence of events that saw the state participation grants awarded prior to initiation of the FSU-Ford contract was unfortunate.

VOLUME IV

JSEP IMPLEMENTATION HANDBOOK

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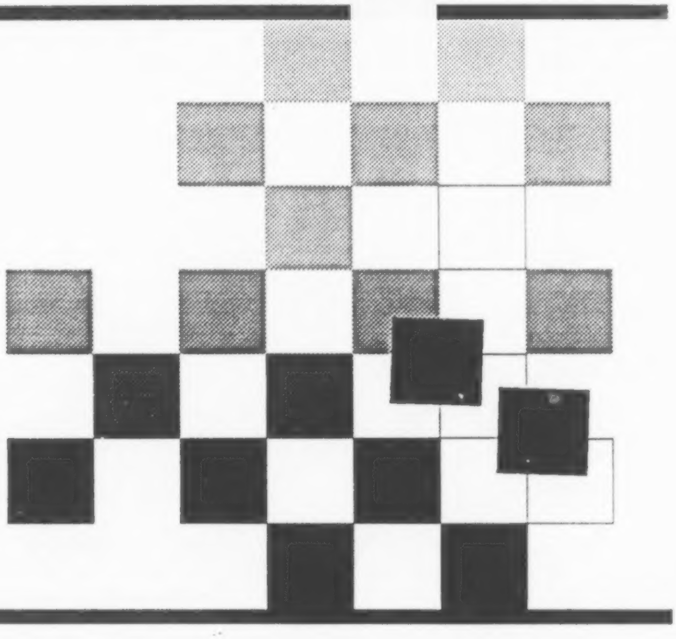
IMPLEMENTATION HANDBOOK



JOB SKILLS EDUCATION PROGRAM

CENTER FOR EDUCATIONAL TECHNOLOGY
FLORIDA STATE UNIVERSITY

FORD AEROSPACE CORPORATION

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Do you have questions or comments about this document? Please write to:

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Center for Educational Technology
Florida State University
Tallahassee, FL 32306

Preface

This handbook is a reference guide for the Job Skills Education Program (JSEP) instructor. It contains guidelines and procedures to successfully implement JSEP in adult basic education, vocational education, or Job Training Partnership Act (JTPA) settings.

All of the information needed to implement the JSEP program is included in this handbook. It is recommended that instructors read through the handbook once for an overview and keep it available as a ready-reference book.

The Job Skills Education Program was developed by Florida State University and Ford Aerospace Corporation under the sponsorship of the U.S. Departments of the Army, Education, Labor, and Defense.

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Chapter 1: JSEP--Program Description

This chapter provides a description of JSEP. The topics discussed here include the learners JSEP was designed to serve, the occupations that the program targets, and the JSEP classroom.

Contents:

What is JSEP?
Who Needs JSEP?
The JSEP Classroom

What is JSEP?

The Job Skills Education Program (JSEP) is a computer-based instructional system designed to improve the career potential of adults. Specifically, JSEP is an academic basic skills program designed to teach adults the skills they need to begin job training. It prepares students who are deficient in basic verbal and quantitative skills, and in learner strategy techniques to understand and use these skills when they encounter formal or on-the-job training.

JSEP comprises more than 300 lessons (300 hours of instruction) and was originally based on a job analysis of 94 Military Occupational Specialties (MOS). The academic skills that came out of the analyses are the basis for JSEP, making it education in direct support of training. The original military analyses have now been adapted to form the basis for civilian training for approximately 20 occupations or prescriptions. Each prescription consists of a series of lessons organized to prepare students to learn occupational skills. Procedures for developing other prescriptions have also been prepared. These procedures are explained later in this handbook.

The civilian version of JSEP operates on the MicroTICCIT computer system. The JSEP classroom consists of an arrangement of computer workstations that are linked together to form a network. Students' progress through the lessons is managed by the Student Management System which tracks individuals as well as classes, thus permitting open-entry and open-exit. The Student Management System also keeps track of students' time on-line, performance data such as the number and type of prescribed lessons, the amount of time spent on each lesson, and test scores. It also produces progress reports for the student, the instructor, and administrators.

Who Needs JSEP?

Student Characteristics

JSEP is intended to serve adults who are deficient in basic skills and wish to prepare for job training. JSEP students must be able to read English at a low level. No prior knowledge of quantitative skills is required. JSEP is most suitable for adults age 16 or older who lack the skills necessary to complete training in their chosen vocation.

JSEP materials are intended to help unemployed or underemployed adults acquire the skills needed to complete job training successfully. Underemployed adults can also benefit from JSEP by upgrading their skills to move to higher paying employment. Job Training Partnership Act (JTPA) participants, Job Corps students, welfare and workfare recipients, displaced workers, and others who face significant employment barriers were an important consideration in the design of the program.

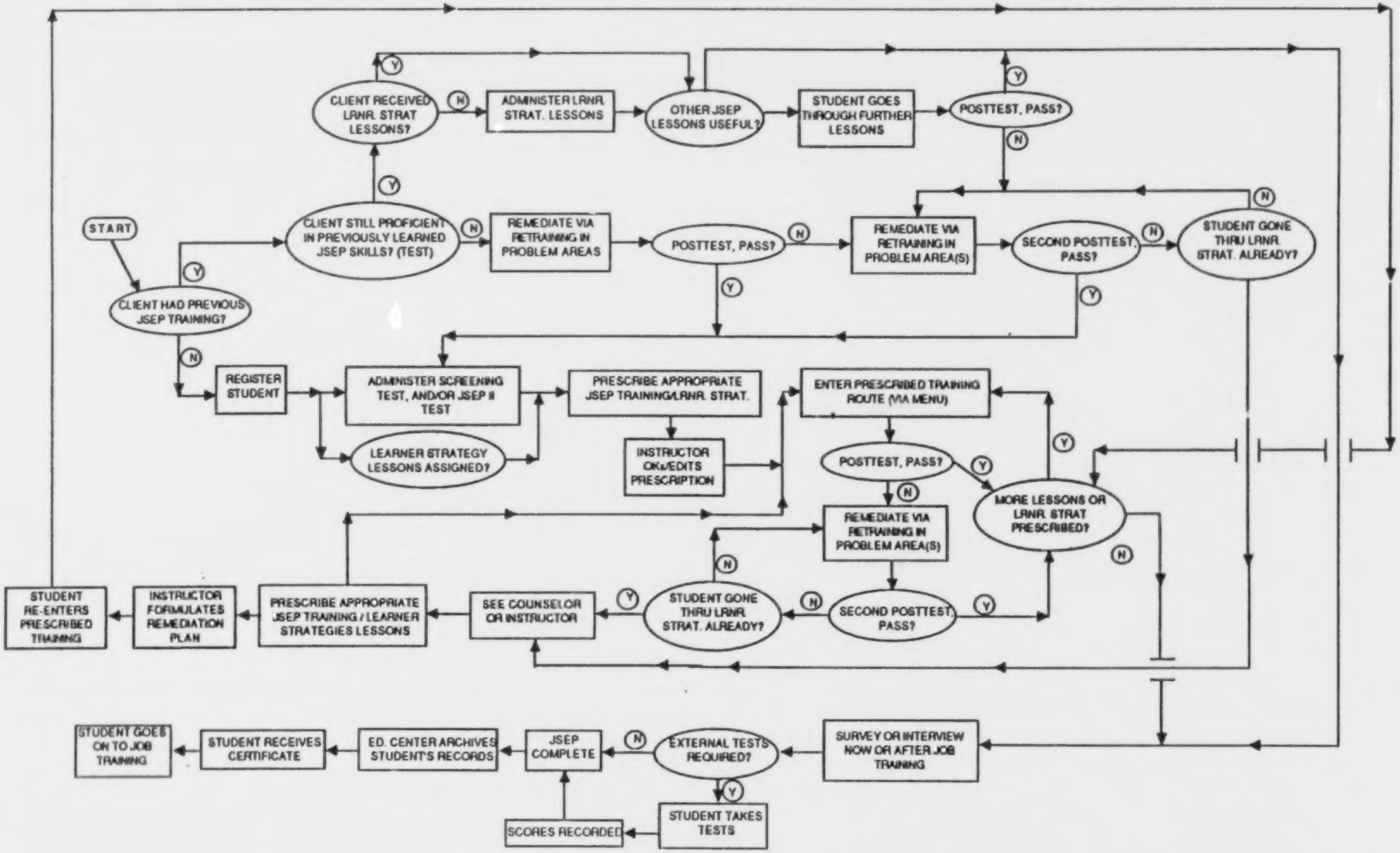
Types of Students Who Might Benefit

Figures 1.1, 1.2, and 1.3 illustrate the types of students who might benefit from JSEP. The first figure, 1.1, deals with students or JTPA clients who are at risk of dropping out of a job training program because they lack the skills necessary to complete the program. Training with JSEP could be used at this time to increase the students' likelihood of success when they return to the training program after completing the appropriate JSEP lessons.

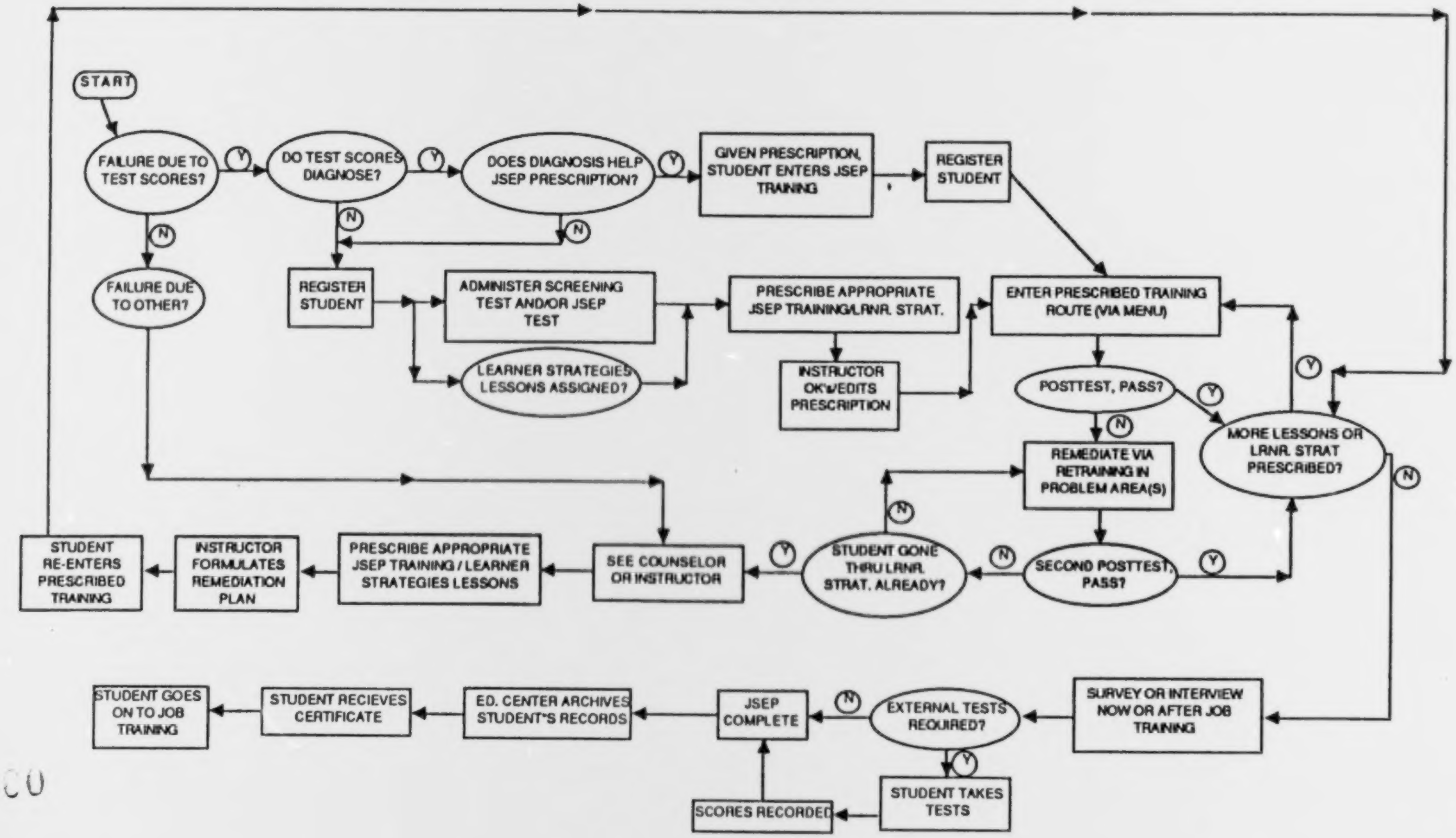
Figure 1.2 refers to students who are unable to begin a training program because of skill deficiencies. These students may have scored poorly on an entry test given by an adult or vocational educational center. For these students, JSEP would be used to bring their ability level up to the point where they would be ready to begin training.

Figure 1.3 refers to underemployed adults. JTPA directors in particular may be interested in this option. JSEP instruction would prove beneficial for adult learners who already have jobs but are not meeting their full potential.

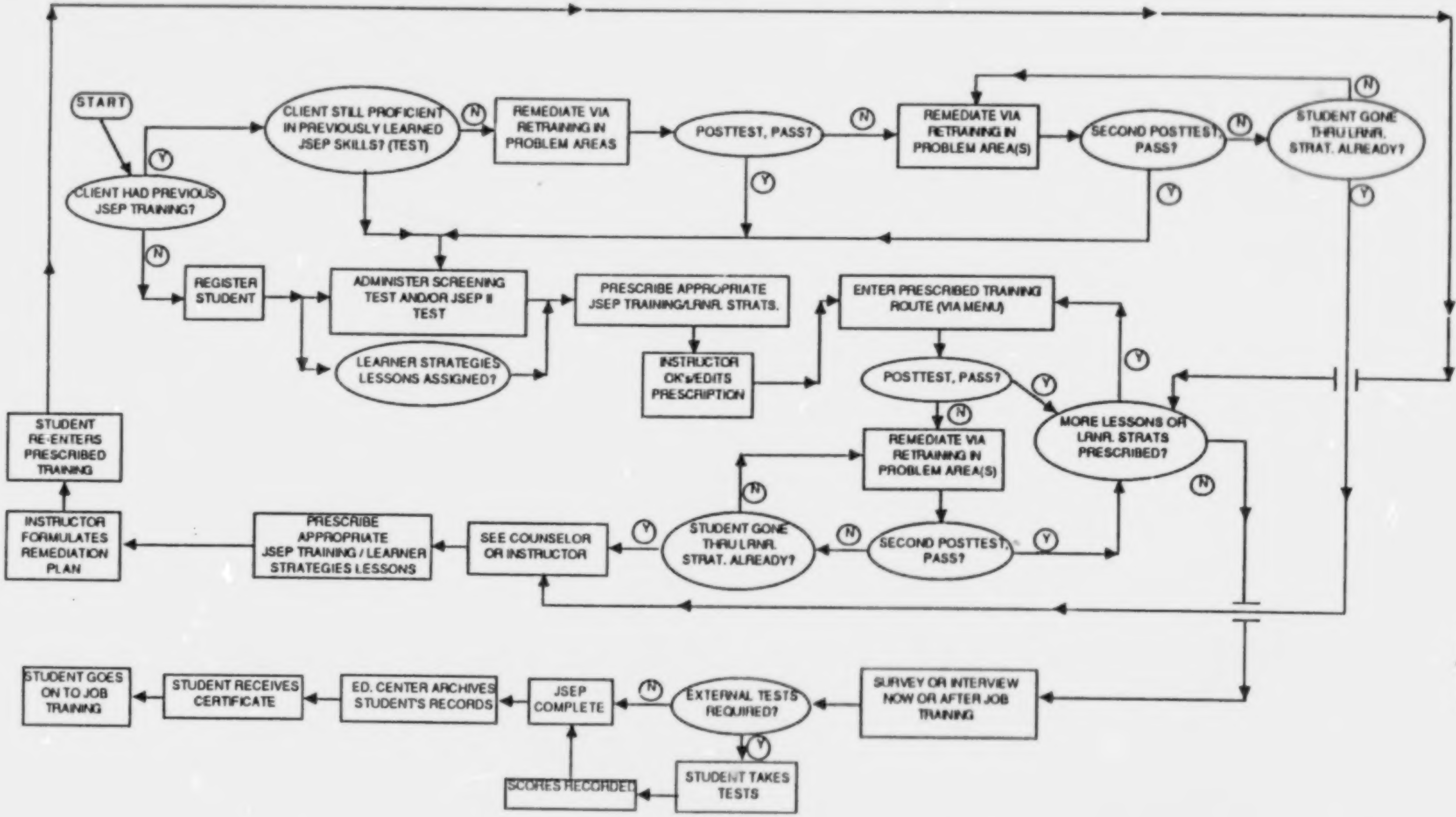
1.1 Client at Risk of Dropping Out of Training


START
CLIENT HAD PREVIOUS JSEP TRAINING?
Y
N
CLIENT STILL PROFICIENT IN PREVIOUSLY LEARNED JSEP SKILLS? (TEST)
CLIENT RECEIVED LRNR. STRAT LESSONS?
ADMINISTER LRNR. STRAT. LESSONS
OTHER JSEP LESSONS USEFUL?
STUDENT GOES THROUGH FURTHER LESSONS
POSTTEST, PASS?
REMEDIATE VIA RETRAINING IN PROBLEM AREAS
POSTTEST, PASS?
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
STUDENT GONE THRU LRNR. STRAT. ALREADY?
REGISTER STUDENT
ADMINISTER SCREENING TEST, AND/OR JSEP II TEST
LEARNER STRATEGY LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNR. STRAT.
INSTRUCTOR OKs/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
MORE LESSONS OR LRNR. STRAT PRESCRIBED?
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
STUDENT GONE THRU LRNR. STRAT. ALREADY?
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
INSTRUCTOR FORMULATES REMEDIATION PLAN
STUDENT RE-ENTERS PRESCRIBED TRAINING
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED. CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECEIVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

1.2 Client Unable to Begin Job Training Without Remediation via JSEP


START
FAILURE DUE TO TEST SCORES?
Y
N
DO TEST SCORES DIAGNOSE?
DOES DIAGNOSIS HELP JSEP PRESCRIPTION?
GIVEN PRESCRIPTION, STUDENT ENTERS JSEP TRAINING
REGISTER STUDENT
FAILURE DUE TO OTHER?
REGISTER STUDENT
ADMINISTER SCREENING TEST AND/OR JSEP TEST
LEARNER STRATEGIES LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNR. STRAT.
INSTRUCTOR OK'S/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
MORE LESSONS OR LRNR. STRAT PRESCRIBED?
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
STUDENT GONE THRU LRNR. STRAT. ALREADY?
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
INSTRUCTOR FORMULATES REMEDIATION PLAN
STUDENT RE-ENTERS PRESCRIBED TRAINING
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED. CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECIEVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

1.3 Increasing Client Options Through JSEP Training


START
CLIENT HAD PREVIOUS JSEP TRAINING?
Y
N
CLIENT STILL PROFICIENT IN PREVIOUSLY LEARNED JSEP SKILLS? (TEST)
N
REMEDIATE VIA RETRAINING IN PROBLEM AREAS
POSTTEST, PASS?
Y
N
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
Y
N
STUDENT GONE THRU LRNR. STRAT. ALREADY?
N
Y
REGISTER STUDENT
ADMINISTER SCREENING TEST AND/OR JSEP II TEST
LEARNER STRATEGIES LESSONS ASSIGNED?
PRESCRIBE APPROPRIATE JSEP TRAINING/LRNR. STRATS.
INSTRUCTOR OK's/EDITS PRESCRIPTION
ENTER PRESCRIBED TRAINING ROUTE (VIA MENU)
POSTTEST, PASS?
Y
N
MORE LESSONS OR LRNR. STRATS PRESCRIBED?
Y
N
REMEDIATE VIA RETRAINING IN PROBLEM AREA(S)
SECOND POSTTEST, PASS?
Y
N
STUDENT GONE THRU LRNR. STRAT. ALREADY?
N
Y
SEE COUNSELOR OR INSTRUCTOR
PRESCRIBE APPROPRIATE JSEP TRAINING / LEARNER STRATEGIES LESSONS
INSTRUCTOR FORMULATES REMEDIATION PLAN
STUDENT RE-ENTERS PRESCRIBED TRAINING
SURVEY OR INTERVIEW NOW OR AFTER JOB TRAINING
EXTERNAL TESTS REQUIRED?
N
Y
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ED. CENTER ARCHIVES STUDENT'S RECORDS
STUDENT RECEIVES CERTIFICATE
STUDENT GOES ON TO JOB TRAINING

Targeted Occupations

These JSEP prescriptions were used in the White Plains demonstration:

- Accounting Clerk
- Bookkeeper
- Clerk-Typist
- Correction Officer
- Electrician
- Fire Fighter
- Home Health Aide
- Machinist
- Plumber
- Record Keeper
- Auto-Body Repairer
- Carpenter
- Computer Operator
- Cosmetologist
- Electronic Assembler
- Floral Designer
- Licensed Practical Nurse
- Nurse's Aide
- Police Officer
- Word Processor

These occupations were chosen based upon their prominence in vocational education, expected growth, and the extent to which they are funded by the Job Training Partnership Act. The lessons included for each of these occupations can be found in Appendix A.

Education for Additional Occupations

There are two ways to develop prescriptions to fit the needs for job training programs outside these 20 occupations:

1. JSEP was initially developed for 94 Military Occupational Specialties (MOS). Civilian equivalents have been determined for these 94 occupations based upon a cross code of MOS and the Department of Labor's Dictionary of Occupational Titles. When vocational training programs are closely related to one of the military occupations, instructors may use the related military prescription information to develop custom prescriptions. In using this method, instructors may occasionally find lessons that are inappropriate. These lessons should be deleted at the time the prescription is created. Appendix B includes the table for equating Military Occupational Specialities with civilian occupations and prescriptions for the 94 MOS.

2. Some instructors may prefer to develop prescriptions for a vocational program by using subject matter experts to determine the lessons that are appropriate. In this case, subject matter experts examine the lessons in the curriculum and create prescriptions for the vocational program. This option can also be used for programs for which there is no military equivalent. Users are welcome to contact the Center for Educational Technology at Florida State University for a description of a procedure based upon the U.S. Air Force CODAP (Comprehensive Occupational Data Analysis Programs) methodology.

The JSEP Classroom

Classroom Management

As mentioned earlier, the JSEP classroom consists of an arrangement of computer workstations that are networked together to a single host. Once the student has been registered for JSEP and a set of lessons is prescribed, it makes no difference which workstation the student uses. The host computer keeps track of students' progress regardless of their location.

Scheduling arrangements should be made at the time of registration. The system can operate 24 hours a day, so it is possible for a single classroom to support three or more sessions a day. For example, if JSEP sessions were scheduled to provide four hours of instruction a day, the first session could run from 8:00 a.m. to 12 noon; the second session from 1:00 p.m. to 5:00 p.m.; and an evening session from 6:00 p.m. to 10:00 p.m.

Self-Pacing and Individualization

JSEP is an open-entry, open-exit program that allows individual students sufficient time to master skills needed for their chosen career program. Students proceed through lessons at their own pace rather than being forced to maintain a uniform speed as in group instruction. The self-pacing feature means that at any one time, each of the students may be working on different skills. The order that lessons follow is arranged to ensure that lower level skills are mastered before higher level skills are taught.

This sequencing feature is handled automatically by the JSEP Student Management System. To accomplish the sequencing tasks, the system maintains master tables of ordering relationships used to establish which series and lessons are available to a student at any given time. Students are allowed to choose among lessons for which there are no prerequisites, or for which prerequisites have been satisfied. JSEP offers individualized instruction which meets individual needs, allows students to set their own pace, and to the extent possible, allows them to choose lesson order.

Chapter 2: The JSEP Instructor

This chapter describes the roles and responsibilities of JSEP instructors. Instructor requirements, including qualifications and skills needed to perform JSEP tasks, are also presented.

Contents:

Instructor's Roles and Responsibilities
Instructor's Requirements

Instructor's Roles & Responsibilities

The JSEP instructor is a multi-talented individual with two primary responsibilities. The instructor functions as both a learning facilitator and a manager of the JSEP classroom.

Learning Facilitator

As a learning facilitator, the instructor may work with guidance counselors, vocational and adult education instructors, JTPA directors, and students. In this capacity, the instructor helps in determining the best type of lesson prescriptions for students.

In addition, the instructor provides motivational feedback to encourage students to continue through their lesson prescriptions in a timely manner. The instructor may tutor students who have difficulty with a particular lesson or with computer operations. Finally, the instructor may also prescribe JSEP learner strategies lessons to help students become more effective learners.

Learning Manager

As a manager, the instructor establishes a routine schedule to service equipment and maintain and update software files. This involves contacting service personnel when equipment is malfunctioning, and performing routine procedures to keep hardware in good working order.

The instructor is also responsible for bringing the system up in the morning, shutting it down at the end of the day, updating data files, creating new student registrations, archiving and deleting student records, and in general, making sure the software functions properly.

Instructor's Requirements

JSEP instructors should have the following qualifications and skills:

Qualifications

1. The instructor must be able to assist students with any lesson. To be prepared to tutor students, the instructor must already know the material or be able to learn it quickly by reviewing the lessons.
2. The instructor must have the ability to perform minimal computer hardware and software maintenance. The necessary procedures are outlined in Chapter 4 of this handbook.
3. Strong organizational skills are required of a JSEP instructor. JSEP is an open-entry, open-exit training program. The instructor must be able to manage the progress of students who are at different points in their lesson prescription.
4. The instructor should possess strong communication skills in order to be able to clarify instructions or offer tutoring to JSEP students as needed.
5. The instructor should have an interest in helping students attain their educational and vocational goals. While JSEP is intended to provide most instruction via computer-based or paper modules, the instructor must ensure that students feel that they have additional support when needed. Students should feel relaxed enough to ask for help when needed, and encouraged enough to maintain a high degree of effort.

Additional Skills

In addition to these five qualifications, JSEP instructors will also become adept at performing a number of tasks unique to JSEP. The instructor must also possess the following skills:

1. Follow JSEP classroom security procedures. JSEP equipment is valuable. Know who is responsible for locking the classroom when it is unattended.
2. During a severe electrical storm, take appropriate precautions with equipment. Appropriate precautions are those precautions established at your site for computer equipment.

3. When equipment is serviced, serial numbers and inventory numbers are recorded on processing forms. It is important to know where serial numbers are located so these numbers can be provided to service personnel.
4. When equipment must be transported, pack it in the original containers. Hardware shipping boxes are built to certain specifications to protect the hardware during transport. These packing boxes usually come with a packing instruction sheet. Packing instructions may also be found in the service manuals.
5. Turn all equipment on and off. Disconnect and connect cables from ports or hubs. Disconnect and connect keyboards, light pens, and monitors from computers.
6. Register students. (See Chapter 6.)
7. Create and modify a prescription. (See Chapter 6.)
8. Change learner strategies prescription defaults. (See Chapter 6.)
9. Update and archive student registrations and records. (See Chapter 6.)
10. Administer paper lessons and tests. (See Chapter 3.)
11. Generate records. (See Chapter 6.)
12. Perform each of the procedures described in the System and MicroTICCIT Operations chapters of this handbook. (See Chapters 4, 5, 6.)

Chapter 3: JSEP Lessons

This chapter describes the types of lessons JSEP provides. Three lesson formats — computer-based, paper, and paper supplements — are discussed. The JSEP terms "lesson" and "prescription" are defined. Procedures for administering different types of lessons are explained, and a student's typical route through JSEP is outlined.

Contents:

Types of Lessons
Lesson Formats
Learner Strategies Modules
Lesson Prescriptions
The Route Through JSEP

Types of Lessons

A JSEP lesson generally consists of two parts: A diagnostic Review Lesson (DRL) and a Skill Development Lesson (SDL). Occasionally a lesson will consist of only a DRL.

Diagnostic Review Lessons

The DRL is presented first. It includes a short review of the topics covered by the lesson objectives. Students who may have learned these materials earlier and forgotten them, or only partially learned them, can use the DRL to recall the materials and try the practice items.

A posttest follows the DRL. If students pass the test, no further instruction on the lesson objectives is required and they move to new materials. If students do not receive a passing score, they are directed to an SDL.

Skill Development Lessons

An SDL presents in-depth tutorial instruction and practice items to help students learn the material. A posttest follows the SDL. If students pass the SDL test, they move to a new lesson. If they fail the test, the students study the SDL again and retake the test. If they pass the test, they move to new lessons. If they fail again, they must work with their instructors either on- or off-line until they can master the materials.

Lesson Formats

JSEP offers three lesson formats: Computer-based or on-line lessons, paper lessons, and paper supplements. Each of these formats is explained below.

Computer-based (On-line) Lessons

The majority of JSEP lessons are presented on the MicroTICCIT system. The first segment, or DRL, presents an introductory screen announcing the name of the lesson (statement of skill), a summary of what will be covered, and a list of any supplemental materials (e.g., paper, pencils, protractor) that may be required. Following the introduction, the lesson begins. Instruction indicating what is expected of the students is clearly displayed on the screen. Students may be directed to press the <ENTER> key to continue in the lesson, the <BACK> key to review, or use other keys for questions requiring a response.

These lessons contain blocks of instruction, examples, and practice items. The amount of text is limited and graphics are used extensively. Most displays require students to interact with the materials.

After completing the DRL and the posttest, students either select a new lesson (if they passed the test) or they move on to the SDL. Students who are routed to further instruction on the same topic do not perceive any break in the lesson flow. Rather, they are presented with a transition screen that informs them that they need more work on the skill. They are then presented with additional instruction, further practice items, and finally another posttest.

If students fail the posttest twice following the SDL, they are told to notify their instructor. The instructor should provide supplementary instruction before permitting students to try the posttest again. At this point, students cannot access the posttest without instructor intervention.

Paper Lessons

Some JSEP lessons are not suited to computer presentation. These lessons usually involve manipulation of tools (e.g., protractors or compasses) or require extensive composition (e.g., essay writing or outlining) that would be difficult for the computer to assess. These lessons are presented in a paper-based format.

Each JSEP classroom should have a complete set of JSEP paper lessons. JSEP paper lessons are reusable. Students should not write in the paper lesson books. A list of supplies (e.g., scratch paper, protractors, pencil) required for a particular lesson is always located on page 3 of the lesson book. Be sure to look at page 3 before giving students the lesson book.

JSEP paper lessons are prescribed by the JSEP Student Management System much like computer-based lessons. When it is time to see a paper-based lesson, a message will appear on the screen directing students to ask the instructor for a particular lesson. Give the students the lesson and any necessary supplies.

When students complete a lesson, they should turn it in and ask for the test. Give them the paper-based test, log on to the computer, and use the instructor intervention options (see Chapter 6) to allow students to proceed with the next lesson. Correct the paper tests, and when the students log off the computer, enter the scores from the paper-based tests. Procedures for entering scores are also found in Chapter 6.

Administering Paper Lessons

1. Distribute the lesson book and supplies needed for the lesson to the student. (A supply list is on page 3 of the lesson book.)
2. When the student completes the lesson, collect the lesson book and scratch paper.
3. Distribute the test book, answer sheet, scratch paper, and supplies.
4. Perform the procedure that allows the student to continue with the next lesson. (See Chapter 6.)
5. Correct the test.
6. Enter the score into the student's record file. (See Chapter 6.)

Paper Supplements

There is another paper-based lesson product called a paper supplement. A paper supplement is a reusable document that complements a computer-based lesson. Lessons which require precise measurements (e.g., measuring the number of degrees of a particular angle or using a protractor to measure changes in terrain) would be difficult to complete on a computer screen. When precise or extensive graphics are a critical part of a lesson, the graphics are printed in a paper-based lesson supplement.

The computer instructs students to refer to the example in the supplement and then respond to a question on the computer. For example, students may be instructed to measure an angle and then input the response on the computer. The computer will provide feedback to the students.

Learner Strategies Modules

In addition to lessons which address job-specific tasks, JSEP offers five Learner Strategies Modules: (1) Problem Solving, (2) Reading Strategies, (3) Test-Taking, (4) Motivational Skills, and (5) Time Management.

Many low achieving learners have a history of academic failure in conventional settings. Continued failure often breeds feelings and attitudes that may interfere with future learning. Such individuals may benefit, both in self-confidence and in learning abilities, from one or more of these Learner Strategies Modules.

A Learner Strategy Module will teach a student how to learn. It is a procedure or a way to think about a subject that helps someone learn, remember, or recall information or skills more efficiently. Here are some terms necessary for understanding the five Learner Strategies Modules:

Tactic

■ A tactic is a specific technique for improving learning ability. For example, reading tactics include skimming, note-taking, and summarizing. An example of a Motivational Skills tactic is imagery.

Strategy

■ A strategy is generally referred to as the combination of two or more tactics. For example, the combined use of skimming, followed by note-taking, and then summarizing would constitute a Reading Strategy.

Metastrategy

■ A metastrategy is a general problem-solving approach for attacking a problem or task. With the exception of Motivational Skills and Test-Taking, the metastrategy taught in the Learner Strategies Modules is called the 4Cs and consists of the following four steps:

1. Clarify
2. Come up with a strategy
3. Carry out a strategy
4. Check results

The Motivational Skills metastrategy is:

1. Prepare (your mood).
2. Keep (a good mood).
3. Change (a bad mood to a good mood).
4. Reap (the benefits of being in a good mood and motivated).

These steps help the learner to (a) select appropriate tactics to form a useful strategy, (b) apply this strategy, and (c) monitor and evaluate the effectiveness of the strategy for solving the problem or performing the task.

Descriptions of Learner Strategy Modules

Problem Solving

Problem-Solving teaches students a useful plan for solving math word problems. This "plan" is the 4Cs metastrategy. Students learn to identify the problem type, diagram and label the problems, and identify useful subgoals.

Reading Strategies

Reading Strategies teach students how to comprehend written material. To do this, the learner is encouraged to break the reading process into three steps: (1) locating, (2) understanding, and (3) remembering main ideas and important details. Reading tactics related to the three steps are also presented. The tactics are skimming, scanning, highlighting, three-step question-answering, note-taking, questioning, elaborating, and summarizing. Students practice selecting and using reading strategies.

Test-Taking

Test-Taking teaches students to improve test performance. Students learn the importance of following directions, and they receive guidelines for guessing and answering questions (e.g., marking, checking, composing). This module is especially valuable for students who are not confident about their test-taking abilities.

Motivational Skills

Motivational Skills teaches students to detect various moods and to use tactics to maintain a positive mood or change a "bad" (inappropriate) mood into a "good" (appropriate) one. These tactics are taught within the context of the "4 keys" to Motivational Skills: prepare, keep, change, and reap. The module describes techniques to prevent occurrence of moods that may be harmful to learning performance.

Time Management

Time Management teaches students to form and carry out goals in JSEP. They learn how to choose a goal, form a plan to reach that goal, and use specific tactics for accomplishing these goals (e.g., placing behaviors in logical order, setting deadlines, using self-rewards when appropriate). These skills and tactics are taught within the context of the 4Cs metastrategy described previously. Another important skill included in this module is monitoring time-on-task.

Guidelines for Prescribing Learner Strategies Modules

Although any student may benefit from the Learner Strategies Modules, students who meet one or more of the following criteria are prime candidates for these modules:

Prescribing Learner Strategies Modules

1. A grade equivalent score on the Test of Adult Basic Education (TABE) at or below the ninth grade level.
2. Failure on the General Educational Development Tests (GED).
3. Request by the student.
4. Instructor observation of student behavior in JSEP and determination of student need.

Lesson Prescriptions

A lesson prescription consists of a series of lessons organized in a hierarchical manner that prepares students to learn vocational skills more efficiently. The JSEP Student Management System tracks the students' progress through the lessons and forces students to work on fundamental lessons before moving on to more advanced lessons. For example, students would see lessons on addition, subtraction, and multiplication before being allowed to see lessons on long division.

Learner Strategies Modules can be prescribed by the instructor after students have started the prescription, or prescribed by the JSEP Student Management System when students fail a pre-specified number of lessons.

The Route Through JSEP

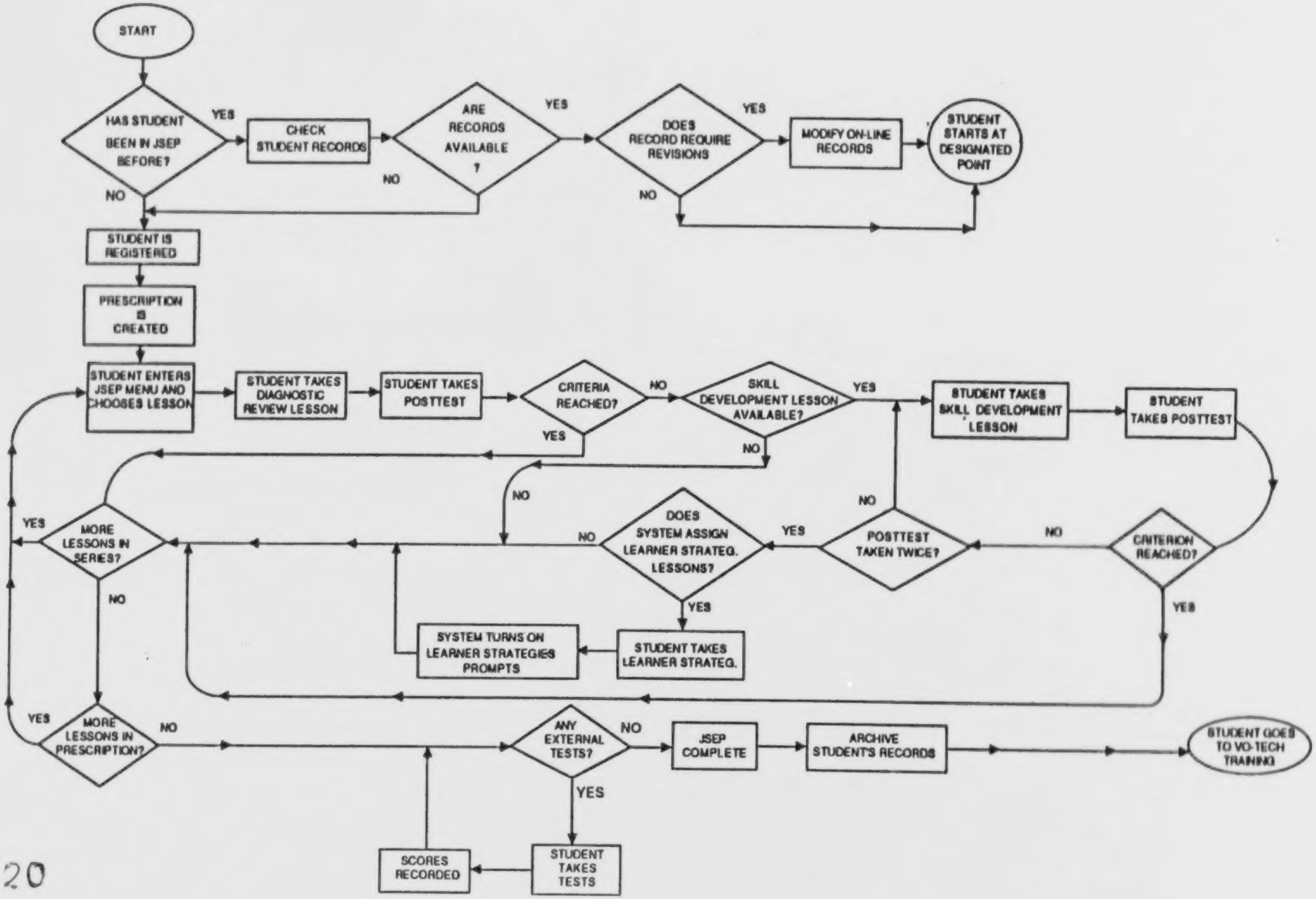
The typical route of a student through JSEP is depicted in Figure 3.1. This figure provides an overview of how an instructor would interact with a student enrolled in JSEP.

The instructor should administer the entrance tests that are required before the student can be admitted into JSEP. Then check to see if the student has been enrolled in JSEP before. If the student has not been enrolled, register the student and create a prescription. If the student has already been enrolled, the student's record may have been archived to create room in the active file for students who are presently working in the JSEP course. Follow the procedures in Chapter 6 to reactivate the student's file. Current prescriptions may also be modified. Again, see Chapter 6 for specific procedures.

Unless the prescription has been modified, the student will encounter the introductory lesson as the first lesson in the prescription. The introductory lesson teaches the student how to use the keyboard and how to select a lesson. The Time Management Learner Strategies Module follows the introductory lesson unless the instructor deactivates the module during the prescription creation process.

After the introductory lesson and Time Management Module, the student selects a lesson from a menu presented on the computer screen. The JSEP Student Management System will automatically guide the student through the prescription until all lessons have been completed. Successful completion of the prescription means the student is ready to go on to the vocational training program he or she has chosen.

3.1 Student Route Through JSEP


START
HAS STUDENT BEEN IN JSEP BEFORE?
YES
NO
CHECK STUDENT RECORDS
ARE RECORDS AVAILABLE ?
YES
NO
DOES RECORD REQUIRE REVISIONS
YES
NO
MODIFY ON-LINE RECORDS
STUDENT STARTS AT DESIGNATED POINT
STUDENT IS REGISTERED
PRESCRIPTION IS CREATED
STUDENT ENTERS JSEP MENU AND CHOOSES LESSON
STUDENT TAKES DIAGNOSTIC REVIEW LESSON
STUDENT TAKES POSTTEST
CRITERIA REACHED?
NO
YES
SKILL DEVELOPMENT LESSON AVAILABLE?
YES
NO
STUDENT TAKES SKILL DEVELOPMENT LESSON
STUDENT TAKES POSTTEST
CRITERION REACHED?
NO
YES
POSTTEST TAKEN TWICE?
NO
YES
DOES SYSTEM ASSIGN LEARNER STRATEG. LESSONS?
NO
YES
NO
STUDENT TAKES LEARNER STRATEG.
SYSTEM TURNS ON LEARNER STRATEGIES PROMPTS
MORE LESSONS IN SERIES?
YES
NO
MORE LESSONS IN PRESCRIPTION?
YES
NO
ANY EXTERNAL TESTS?
NO
YES
STUDENT TAKES TESTS
SCORES RECORDED
JSEP COMPLETE
ARCHIVE STUDENT'S RECORDS
STUDENT GOES TO VO-TECH TRAINING

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Chapter 4: System Hardware and Operations

Chapter 4 begins with a description of the equipment on which JSEP operates. System operations and the instructor's role in operations are also described.

Contents:

JSEP Hardware
How the System Works
System Operations
- Bringing Up the System
- Shutting Down the System
- Restoring the System and Loading New Materials onto the System
- Caring for Tapes and the MicroTICCIT System

JSEP Hardware

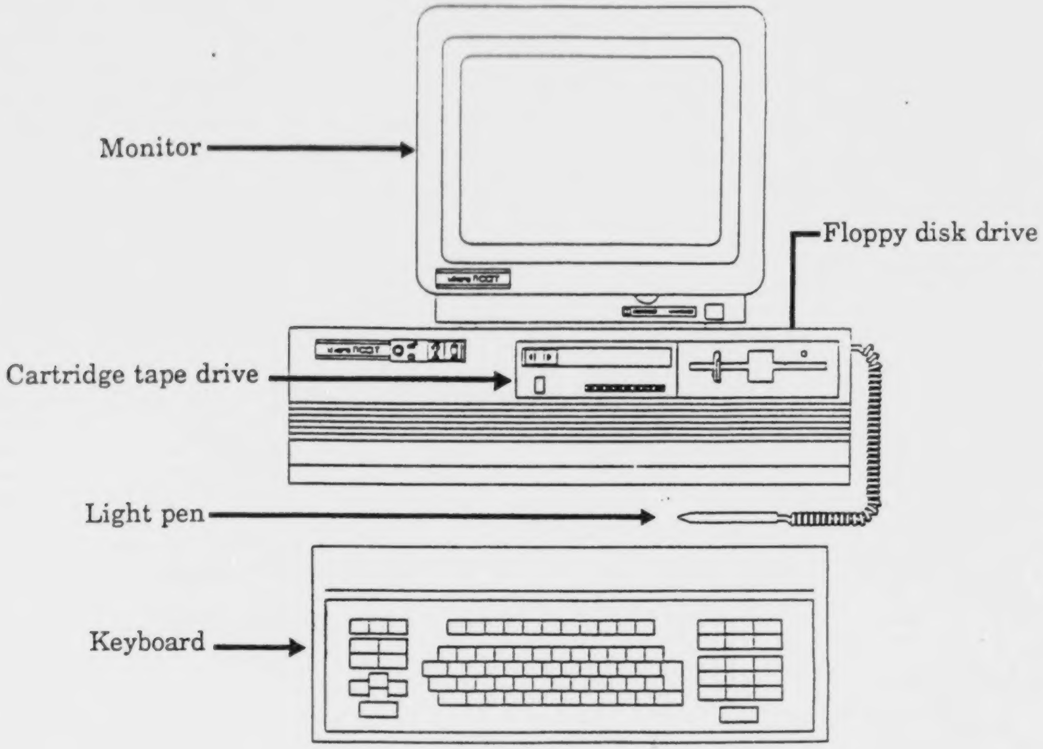
System configuration and the number of student workstations on each system differ from site to site. Nevertheless, each JSEP system consists of some common hardware and equipment arrangements.

The JSEP system comprises one MicroTICCIT host, student workstations, a system printer console, and a local area network (LAN) that connects student workstations to the host.

MicroTICCIT Host

Usually the host workstation (Figure 4.1) includes an AT-style microcomputer with a floppy diskette drive, a fixed disk drive and disk controller, a cartridge tape drive, a LAN interface board, and a high-resolution display board. A MicroTICCIT keyboard, high-resolution 13 inch color monitor, light pen, and printer are cabled to the processor.

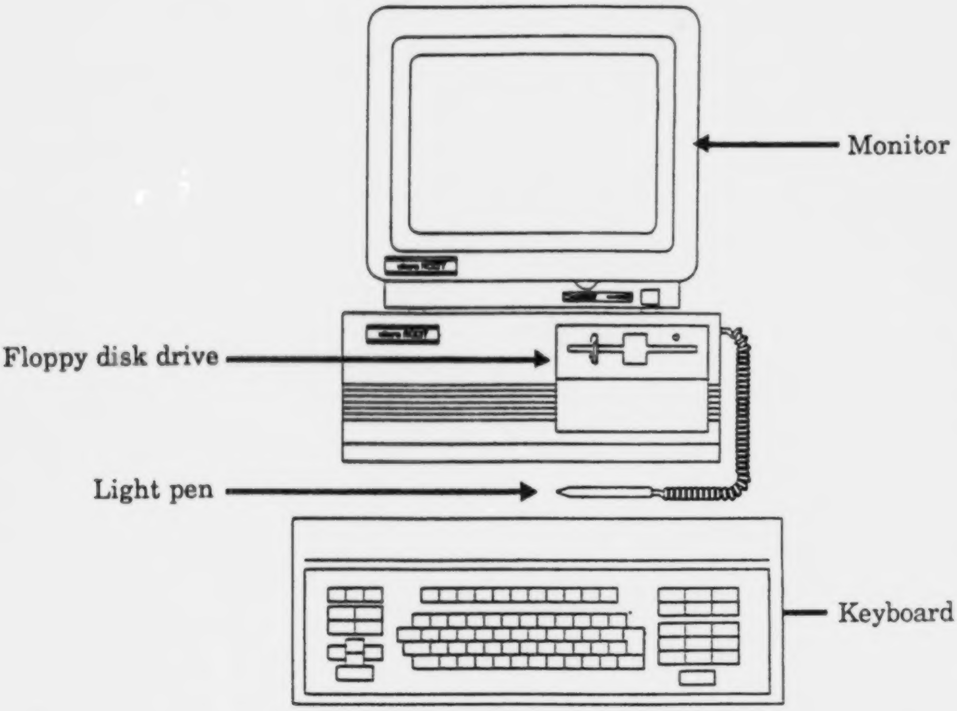
4.1 MicroTICCIT System Host and Workstation



Student Workstations

The student workstations (Figure 4.2) consist of a personal XT-style computer with a floppy diskette drive and disk controller, high-resolution display board, and LAN interface board. A MicroTICCIT keyboard, high-resolution 13 inch color monitor, and light pen are cabled to the processor.

4.2 MicroTICCIT Student Workstation



Local Area Network

A local area network (LAN), consisting of boards, cables and hubs, interconnects the host and the student workstations. A cable connects the LAN board in the host and each student workstation via a port on a hub. Each hub may have six, eight, or sixteen ports. The hubs can be interconnected by running a coaxial cable from one port on one hub to a port on another hub to create a network.

How the System Works

The host workstation is the heart of the MicroTICCIT system. Information moves between the fixed disk in the host and the workstations on the network. The tape drive in the host provides a secondary data storage medium which is used to back up the system software and the files stored on the fixed disk. The tape drive loads new releases of the MicroTICCIT system and courseware onto the fixed disk. Backup tapes also store copies of the MicroTICCIT system and JSEP courseware in case of system failure. Tapes also store student records when they are removed from the system after a student completes JSEP. When tapes are removed from the system they must be carefully stored for future use. (The method for caring for tapes is described later in this chapter.)

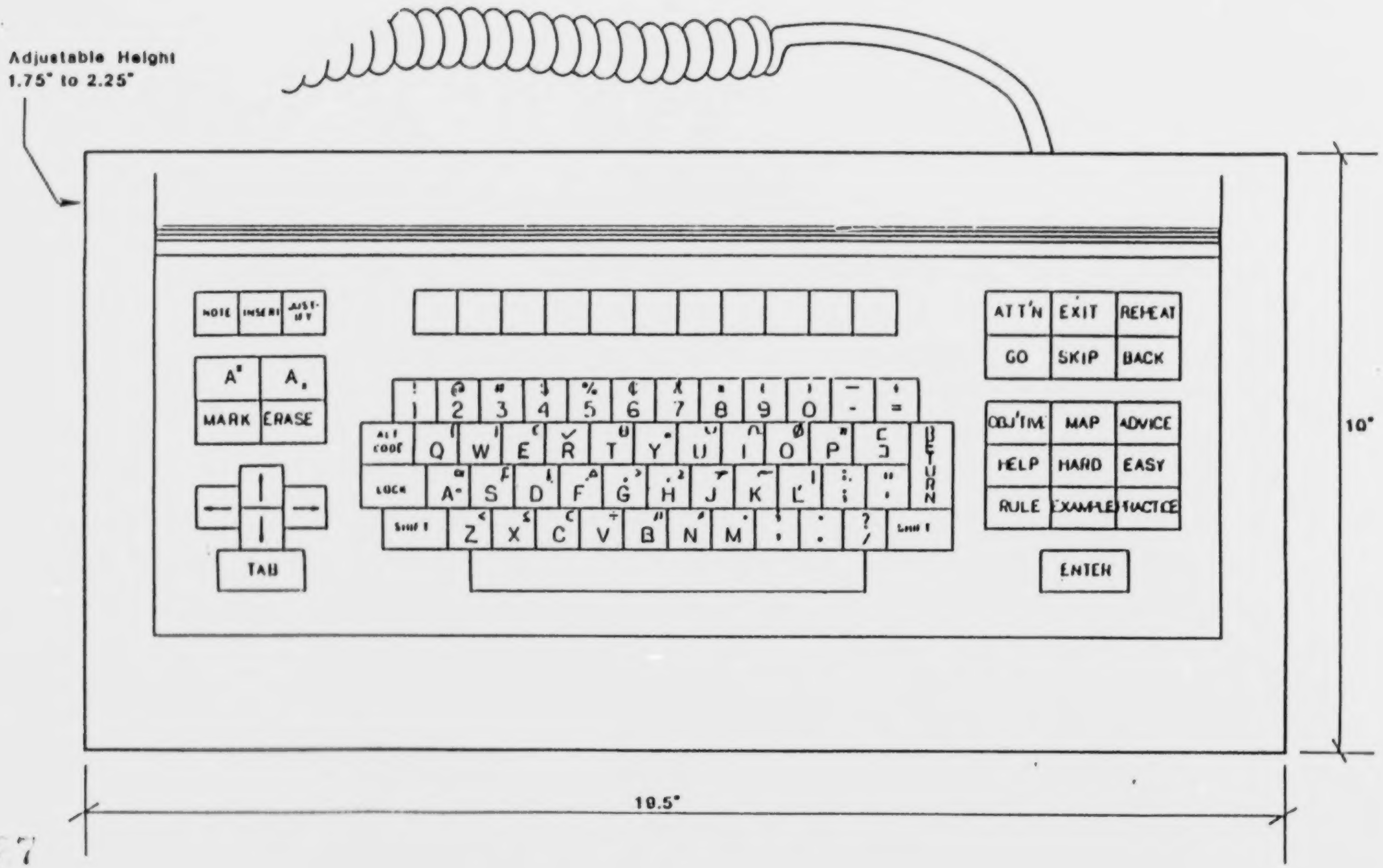
The MicroTICCIT system is operated from the host workstation. (System operations are explained in detail below.) Because the host workstation brings up the system, it should be used only by the instructor and system operator. Students should not be allowed to use the host workstation as a student station.

A warning is necessary here. If the host workstation is damaged, the entire system will not operate. If a student workstation is damaged, only that station is inoperable. Therefore, it is essential that students be restricted from using the host as a workstation.

The high-resolution color monitor attached to the host is used to operate the system, as well as to display JSEP and other courseware. The keyboard and light pen allow the user to interact with the system. Both devices are used when operating the system.

The keyboard works as any standard keyboard (Figure 4.3). There are, however, a few special keys that are used to operate the system. By using the tip of the light pen to touch certain highlighted areas of the monitor screen, the user can give input to the system without using the keyboard.

4.3 MicroTICCIT Keyboard



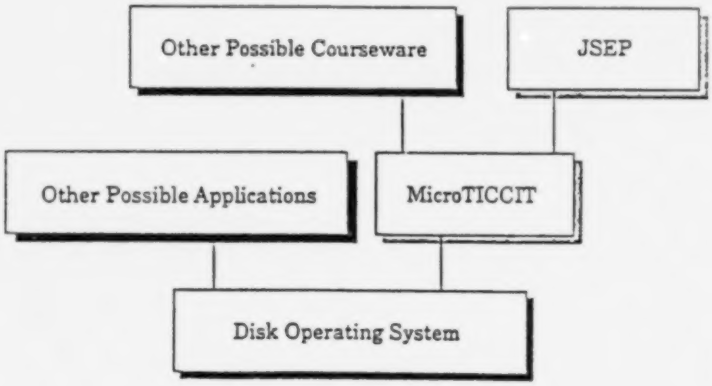
System Operations

Chapter 2 describes the role of a JSEP instructor. This section describes the instructor's role as the system operator. Because JSEP is primarily computer-based instruction, proper operations are critical to the success of the program.

On a typical day, the operator/instructor brings up the system in the morning. It runs all day by itself while the instructor works with students taking JSEP lessons. At the end of the day, the instructor backs up the students' records and brings the system down. Every week or two, the instructor prints out student test log data and other reports to help manage the students' progress. Occasionally, the instructor must load new courseware tapes and system releases onto the system.

Like all computers, MicroTICCIT makes use of both system and applications software programs to do its job. The computer requires an operating systems program in order to know what to do, that is, to operate the keyboard, monitor, and printer. It needs memory to organize, manage, locate, and access information files stored in the drives. In this case, the operating system is called DOS. An applications program is a program designed to do a specific job, such as word processing or data processing or, in the case of MicroTICCIT, present a large instructional system such as JSEP on-line lessons and JSEP Student Management System. Actually, TICCIT is an intermediate systems program working between the operating system and the JSEP courseware application (Figure 4.4). Interaction with the MicroTICCIT system below the TICCIT level must be performed at the host workstation.

4.4 MicroTICCIT Software Relationships



Three main operations procedures are necessary to run a JSEP program. The operator must perform the following functions:

- Bring up the system.
- Shut down the system.
- Restore the system when it has failed and load new materials onto the system.

In addition to these three functions, the operator must care for tapes and the MicroTICCIT System.

These functions as well as how to care for tapes and the MicroTICCIT System are described here.

NOTE: The following conventions are used throughout this handbook to describe operations and functions:

- Upper case italics indicate screen menus and user response areas.
- Lower case italics indicate screen displays.
- Quotation marks (" ") around text indicate messages that appear on the screen.
- Bold text indicates letters, words, and numbers for you to type.
- The symbols < and > indicate key presses. For example, <RETURN> represents the return key.
- Numbered lists (1, 2, etc.) indicate a procedure with two or more sequential steps.

Bringing Up The System

When starting the computer, it is always necessary to bring up the operating system program first and the applications program afterwards. Otherwise the computer will not become operational. The applications program cannot run without the systems program because the computer cannot interpret the information contained in the applications program.

To bring up the system, complete the following four stages:

Stage 1. Turn on the Power

Turning on the Power

1. Locate the power switch and turn on the monitor. The power switch may be a button on the front of the monitor labeled "Power" or a toggle switch on the right side of the back of the monitor.
2. Locate the power switch and turn on the computer. The power switch is on the right side of the back of the computer.
3. The *TICCIT/DOS MAIN MENU* appears, indicating that the disk operating system is active.

Stage 2. Conduct a Read and Check Procedure

The read and check procedure is a safety procedure. It determines whether sectors from the disk drive can be accessed without hardware error, and it verifies the consistency of the internal system directories and bitmaps. If for some reason this information is not where it should be, the TICCIT program will not run as it should and as a result, it may be damaged.

As the computer checks for errors, there will be pauses in the process. It takes several minutes to read and check the disk. If no errors appear on the screen, you are ready to bring up TICCIT. If an open file error appears, you can fix it as explained in the procedure. If any other error messages appear on the screen, contact the Ford Aerospace customer service representative immediately. Do not try to bring up the system to TICCIT if an error is indicated. Perform the read and check procedure every time you bring up the system.

The following steps describe the read and check procedure:

Conducting a Read & Check

1. From the *TICCIT/DOS MAIN MENU*, select Option 3: *Run DISKMAINT (TICCIT Disk Check/Fix/Backup Program)*, and press <RETURN>. While you wait, you will see *C:\ > ECHO OFF* appear twice. Then the display will change to the Terminal Status Display. Finally, you will get a display entitled *DMOS #### FALCON DISKMAINT*, where *####* is the current release number. You will interact with this display to run the read and check program.
2. At the *Option:* prompt, type **READ**. Press <RETURN>.
3. At the *Disk to Read*: prompt, type **DP0**. Press <RETURN>.
4. At the *Filename or Sector Range:* prompt, type a comma (,). Press <RETURN>. Wait a few minutes for the program to read the disk. When the read program finishes, a message appears that says "Operation Successfully Completed." You are now ready to run the check part of the program.
5. At the *Option:* prompt, type **CHECK**. Press <RETURN>.
6. At the *Disk to Check:* prompt, type **DP0**. Press <RETURN>.
7. At the *Check Option:* prompt, type **GO**. Press <RETURN>. Wait a few minutes for the program to check the disk. When the check program finishes, a message should appear that says "No 'Check' Errors Detected."

If you get an error message that shows open files, you can fix that problem. The entry on the screen will list the open files and say, "N Fixable Directory Entries," where "N" is the total number. To fix the problem, type **FIXUP** at the check option and press <RETURN>. When that is complete, type **REPEAT** and press <RETURN>. You should then get a message that says "No 'Check' Errors Detected." Continue the process of checking your disks.

Although you may have only one fixed disk drive on your system, it will be divided into several "logical disks." DOS thinks of each logical disk as a separate disk drive. Therefore, you need to perform the read and check procedure for each logical disk on your system. No matter how many fixed disk drives are on the system, there will be between three and eight logical disks, numbered DP0 through DP7. The usual situation is to have DP0, which is the system disk, DPl, which is the registration and student record disk, and DP2 or more which are the courseware disks.

8. *Repeat Steps 2 through 7* to read and check the rest of your disks. Remember that on Steps 3 and 6 you must put in the new disk number, e.g., DPl or DP2. If you know how many logical disks you have, stop when you have completed Step 7 for the last disk, and continue with the process described below. If you are not sure how many logical disks you have, continue putting in disk numbers until you get the message "Illegal Disk Name." The number before that one was the last disk on your system. Enter it and run it again. From then on you will know where to stop.

9. At the *Check Option:* prompt, type **QUIT**. Press <RETURN>. The following message appears on the screen: "Operation Successfully Completed."

10. At the *Option*: prompt, type **STOP**. Press <RETURN>. You will return to the *TICCIT/DOS MAIN MENU*.

Stage 3. Bring up TICCIT

Bringing up TICCIT

1. You are on the *TICCIT/DOS MAIN MENU*. Select *Option 1: Start Up Workstation(s) for Student Use (Run TICCIT)*. Press <RETURN>. Wait a short time until the *TICCIT ATT'N* display appears. You are now ready to log onto TICCIT and JSEP. (The log on procedure is explained in Chapter 6.)

   As you can see from the *TICCIT/DOS MAIN MENU*, there are other ways to bring up TICCIT. The method described above is the easiest method.

Stage 4: Turn on the Student Workstations

Turning on Student Workstations

1. Insert the Terminal Processor Operating System (TPOS) diskette into the primary diskette drive on each student workstation computer. (If the computer has more than one diskette drive, be sure to use the primary drive.) Close the diskette drive. (The host computer does not require this diskette because TPOS is on the hard disk.)

NOTE: The diskettes can be left permanently in the diskette drives if you wish. Leaving them in the drives will save you time each day. However, if you think students may bother them, remove the diskettes and store them each day.

2. Turn on the monitor at each workstation exactly as you did in Stage 1.1 above for the host monitor.
3. Turn on the computer at each workstation exactly as you did in Stage 1.2 above for the host computer.
4. Check to see that the proper TICCIT ATT'N display appears on each monitor.

Shutting Down The System

Shutting down the system is conducted in two stages. These stages and the steps that must be performed to complete them are described here.

Stage 1: Shut Down TICCIT

Shutting Down TICCIT

1. From the host workstation, log on to Course 0. (Instructions for logging on and off the system are found in Chapter 6.) The TICCIT "Supermenu" appears.

   The TICCIT Supermenu is the root menu for the system. It contains five options:

   - Author Menu
   - Operator Menu
   - Programmer Menu
   - Instructor Menu
   - Student Menu

   Each of these options allows access to one of TICCIT's interactive modes.

NOTE: The instructor option in the Supermenu is not the same as the JSEP Instructor's Menu discussed in Chapter 6. If you want to access the JSEP course, press <5> (Student Menu) and then press <ENTER>. Next, press <4> (change course) and then press <ENTER>. Log on to Course 146, press <ENTER>, and then press <HARD> to access the JSEP Instructor's Menu.

2. Select Option 2: *Operator Menu*, and press <ENTER>. The Operator Menu appears.

3. Select Option 1: *Log on, Log off, Startup, Shutdown Menu*, and press <ENTER>. The Log on Menu appears.

4. Select Option 1: *Perform System Shutdown*, and press <ENTER>. The *Terminal Log Off/System Shutdown* display appears.

5. Press <OBJ'TIVE>. You will see the *Terminal Status Display*. This display is a color-coded matrix with a legend that tells you which workstations are being used and for what they are being used. Workstations may be in use (that is, students may not have logged off) even when no one is sitting in front of them. If you need more information about the display, press <ADVICE>.

6. Log off any workstations in use. Turn off the monitor and computer at each workstation except for the host workstation, which still displays the terminal status.

7. Return to the host workstation and check the terminal status. All stations should now be logged off except the one you work on, which will show up in black. Press <EXIT>. This will return you to the *Terminal Log Off/System Shutdown* display.

8. At the *Terminal Log Off/System Shutdown* display, change the first N to a Y by pressing <Y> in the box. You must type Y because you are still on your terminal. Leave the remaining three default N's, since this will protect the students' performance data should you attempt to shut down while someone is taking a test. You can use the controls in this display to force a terminal to log off, but this will destroy performance data that has been generated. You should only force terminals to log off in an emergency. The best way to guard against losing data is to be sure that every terminal is logged off before proceeding with the shutdown procedure. Therefore, leave the default N's in the three boxes. Also leave the default Y in the fifth box.

9. Press <ENTER>. All monitors display the TICCIT shutdown graphic. This display changes to the *TICCIT SHUTDOWN* display. After a brief time, the system returns to the *TICCIT/DOS MAIN MENU*. You are now ready to back up the students' records to tape.

NOTE: If your system is in an area that has frequent power failures or unreliable electrical power, it is recommended that you perform a read and check procedure at this point. Follow exactly the same procedure that is outlined in Stage 2 under the section for Bringing Up the System. If any errors are indicated, contact your Ford Aerospace customer service representative immediately. When you have completed the read and check successfully you may conduct the daily backup.

It is also recommended that you add a battery backup/surge protector to your system if you have frequent power fluctuation or failures.

Stage 2: Conduct Daily Backup

Conduct a backup procedure daily to create a backup file of the students' records on magnetic tapes in case of system failure. The tapes store students' progress data and can be used to restore data to the fixed disk after system failure. Back up only DP1, which is the logical disk that contains the registration and student data. This is the only material that changes daily.

You should have a set of archive cartridge tapes safely stored, containing the system software on DP0, the courseware on DP2, and perhaps other logical disks. Use tapes to restore the rest of the system in case of system failure. These materials will not change often. When they do, you will receive new backup tapes.

You should also have a set of five blank cartridge tapes in plastic cases. Remove them from the cases and label each of these tapes DPl JSEP TICCIT. Then write "Monday" on one tape, "Tuesday" on the next, and so forth, through "Friday." Return them to their cases for safe storage. Use one of these tapes each day so that you have a week's backup. Then you start over the next week. These tapes write over themselves, so you do not need to do anything to reuse the tapes.

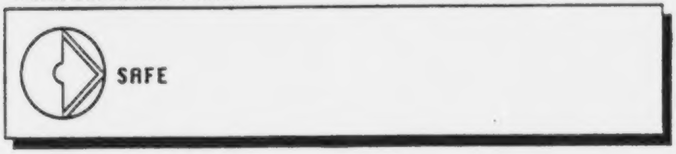
The following steps describe the daily backup procedure:

Conducting a Daily Backup Procedure

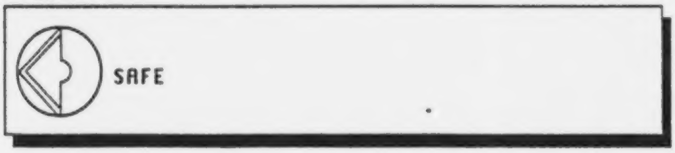
1. Get the properly marked tape for today. Remove it from the case. The left top corner of the tape has a black plastic screw and the word SAFE written beside it (Figure 4.5). Turn the screw so that the arrow points away from the word SAFE. (You can turn the screw with your finger, but a small screw driver makes the job easier.) Turning the screw away from SAFE allows you to write, or copy, information onto the tape. When the arrow points to SAFE, the disk is write protected and you cannot back up materials on it.

4.5 Cartridge Tapes (side view)

Write Protected Position



Copy Position



2. Insert the tape into the left drive (cartridge tape drive) on the front of the computer (see Figure 4.1). (The other drive is the floppy diskette drive.) Insert the tape with the metal side down and the tape reel to the left. Put the tape firmly into the drive until the small black release bar springs up to hold the tape in place.

3. At the TICCIT/DOS MAIN MENU, select Option 3: Run DISKMAINT (TICCIT Disk Check/Fix/Backup Program). You will see C:\> ECHO OFF, followed by the Terminal Configuration display, and then a new display which says "DMOS [Release Number] FALCON DISKMAINT." Below that, you will see "Option:" Type in **DUMP** and press <RETURN>.

4. You will see a series of prompts that should be filled in as follows. First is "Disk to DUMP From:" Type in **DP1** and press <RETURN>.

5. Next you will see "Filename or Sector Range:" Type in **,** [a comma] and press <RETURN>.

6. Next you will see "Tape File to DUMP To:" Type in **MT0:0** and press <RETURN>. Wait briefly.

7. Then you will see "Tape File Label:" You may type in any label that will identify this tape. It is recommended that you type in **DP1, Sector Number (,)** today's day, date, and time, **Tape 1 of 1**, and your initials. (This information will be recorded on the tape and will appear on the screen when you lead the tape.) Press <RETURN> and wait several minutes for the tape to dump. When the dump is completed, you will see "Operation Successfully Completed."

8. Since DP1 requires only one tape to back it up, you are finished with this procedure. You will see "Option:" appear on the screen. Type in **Stop**, and you will return to the TICCIT/DOS MAIN MENU.

9. Remove the cartridge tape from the disk drive by pushing it in slightly. The black bar releases. Slide the tape out.

10. Turn the black plastic screw until the arrow points to the word SAFE. The tape is now write protected. In pencil, write your initials and today's date on the label. Insert the tape into the plastic case.

11. Store the tape in a locked cabinet. It is your only copy of the students' records for the day.

12. Turn off the computer and the monitor at the host workstation.

Restoring The System And Loading New Materials Onto The System

From time to time, as new lessons are developed, existing lessons are revised, and new system releases produced and distributed, you will receive update tapes to load onto the system disks. This procedure is called restoring the disk. In addition to replacing materials on the disks, you will replace your current system and/or courseware backup tapes with these new tapes.

If a system failure wipes out the data on your disks, you can restore them, using the backup tapes you previously archived.

Although the procedures are basically the same as far as operations are concerned, let us consider them separately.

Stage 1. Restoring the System

If a failure deletes data from one or more of your logical disks, restore the data from your archived tapes. Remember that you have a system disk called DP0, a registration and student data disk called DPl, and one or more courseware disks, called DP2 through DP7. Restore any disks that have been wiped out. You can restore these disks in any order, although the order given below starts with DP0.

Complete the following steps:

Restoring the System

1. Get the archived tape labelled DP0. Be sure the arrow on the black plastic screw points to SAFE so that the tape is write protected. Insert the tape into the left drive (the cartridge tape drive) with the metal side down and the reel to the left. Push it firmly in place until the release bar springs up to hold the tape.

2. Turn on the monitor and the computer at the host workstation. At the TICCIT/DOS MAIN MENU select Option 3: Run DISKMAINT (TICCIT Disk/Check/Fix/Backup Program) and press <RETURN>. You will see C:\> ECHO OFF, followed by the Terminal Configuration display, and then a new display which says "DMOS [Release Number] FALCON DISKMAINT." Below that, you will see "Option:" Type in **LOAD** and press <RETURN>.

3. You will see a series of prompts that should be filled in as follows: First is "Tape File to Load From:" Type in **MT0:0** and press <RETURN>. Wait briefly for the next prompt to appear.

4. Next you will see "Tape File Label:" After the colon, the label that you put on that tape when you made it will appear on the display exactly as you entered it when the tape was made. Confirm that you have inserted the correct tape.

5. Then you will see "Disk to Load To:" Type in **DP0** and press <RETURN>. Wait several minutes until the tape is loaded on the disk. When the tape is loaded, you will see "Operation Successfully Completed."

6. Next you will see "Option:" Type in **Rewind** and press <RETURN>.

7. Next you will see "Tape Unit to Rewind:" Type in **MT0**. Wait briefly for the tape to rewind. When the operation is completed, you will see "Operation Successfully Completed."

8. Next you will see "Option:" Type in **Stop,** and you will return to the TICCIT/DOS MAIN MENU.

9. If you wish to restore DP1, repeat Steps 1 through 8 above. The only changes to the procedure are to select the proper DP1 tape and type in **DP1** at Step 5.

Call the Ford Aerospace customer service representative for assistance if your system will not operate properly after you have restored the disks.

Stage 2. Loading New Courseware Releases

When you receive a set of tapes with new or revised lessons, you have to restore the courseware disk or disks on your system and replace the courseware backup tapes in your archive files with the new tapes.

Loading New Courseware Releases

1. Get the new set of tapes. Be sure the arrow on the black plastic screw points to SAFE on each of the tapes.
2. You will have five tapes to load to restore DP2. Although they do not have to be loaded in any special order, it is easiest to load them from first to last unless you are just restoring one sector of DP2. Insert the first tape into the tape drive.
3. Turn on the monitor and the computer at the host workstation. At the TICCIT/DOS MAIN MENU select Option 3: Run DISKMAINT (TICCIT Disk/Check/Fix/Backup Program) and press <RETURN>. You will see C:\> ECHO OFF, followed by the Terminal Configuration display, and then a new display which says "DMOS [Release Number] FALCON DISKMAINT." Below that, you will see "Option:" Type in **LOAD** and press <RETURN>.
4. You will see a series of prompts that should be filled in as follows: First is "Tape File to Load From:" Type in **MT0:0** and press <RETURN>. Wait briefly for the next prompt to appear.
5. Next you will see "Tape File Label:" After the colon, the label that was put on that tape when it was made will appear on the display exactly as it was entered when the tape was made. Confirm that you have inserted the correct tape. Confirm the sector numbers especially.
6. Then you will see "Disk to Load To:" Type in **DP2** and press <RETURN>. Wait several minutes until the tape is loaded on the disk. When the tape is loaded, you will see "Operation Successfully Completed."
7. Next you will see "Option:" Type in **Rewind** and press <RETURN>.

8. Next you will see "Tape Unit to Rewind:" Type in **MT0**. Wait briefly for the tape to rewind. When the operation is completed, you will see "Operation Successfully Completed." Remove that tape from the disk drive and put it in its case for storage.

9. Insert the next tape to be loaded on the disk. Be sure the arrow points to SAFE.

10. Next you will see "Option:" Type in **Load** and press <RETURN>. Repeat Steps 4 through 9 until you have loaded all the tapes that must be used to restore the disk. That will normally be five tapes. After you have loaded all of the tapes, you will see "Option:" once more. This time type in **Stop**, and you will return to the TICCIT/DOS MAIN MENU.

11. If you are to keep the new set of tapes, store the five tapes in your archive file in place of your earlier DP2 backup tapes. Be sure the labels on the tapes indicate the most recent copies and the sector numbers.

Making Backups of Courseware Tapes

If you must return the tapes, you will have to make your own backup copies. First, load the courseware onto your disks as explained above. Then use the following procedure to back up the disk to tapes so that you have a new set of courseware tapes for your archives.

1. Turn the arrow on the black screw so that the arrow points away from the word SAFE. Insert a tape into the left drive (cartridge tape drive) on the front of the computer. Insert the tape with the metal side down and the tape reel to the left. Push the tape firmly into the drive until the small black release bar springs up to hold the tape in place.

2. At the TICCIT/DOS MAIN MENU, select Option 3: Run DISKMAINT (TICCIT Disk Check/Fix/Backup Program). You will see C:\> ECHO OFF, followed by the Terminal Configuration display, and then a new display which says "DMOS [Release Number] FALCON DISKMAINT." Below that, you will see "Option:" Type in **DUMP** and press <RETURN>.

3. You will see a series of prompts that should be filled in as follows: First is "Disk to DUMP From:" Type in **DP2** and press <RETURN>.

4. Next you will see "Filename or Sector Range:" For the first tape of the five tapes needed to back up DP2, type in **,317777** and press <RETURN>.

5. Next you will see "Tape File to DUMP To:" Type in **MT0:0** <RETURN>. Wait briefly.

6. Then you will see "Tape File Label:" You may type in any label that will identify this tape. It is recommended that you type in **DP2, Sector Number ,317777,** today's day, date, and time, **Tape 1 of 5**, and your initials. (This information will be recorded on the tape and will appear on the screen when you load the tape.) Press <RETURN> and wait several minutes for the tape to dump. When the dump is completed, you will see "Operation Successfully Completed."

7. Remove the first tape and label it carefully, using the same label you put on-line. Turn the black plastic screw until the arrow points to the word SAFE. The tape is now write protected. Store it carefully in its case.

8. Repeat Steps 1 through 7 for the other 4 tapes except for the sector number in Steps 4 and 6 and the tape label in Step 6. In the label, change the tape number to **Tape 2 of 5**, **Tape 3 of 5**, **Tape 4 of 5**, and **Tape 5 of 5**, as appropriate. Also change the sector numbers in Steps 4 and 6, as follows: Tape 1 is Sector Number **,317777**. Tape 2 is Sector Number **320000,637777**. Tape 3 is Sector Number **640000,1157777**. Tape 4 is Sector Number **1160000,1477777**. Tape 5 is Sector Number **1500000,**.
9. When you have dumped all five tapes, you are finished with this procedure. You will see "Option:" appear on the screen. Type in **Stop**, and you will return to the TICCIT/DOS MAIN MENU.
10. Store the tapes in a locked cabinet. These tapes are your only copies of the JSEP courseware.
11. Turn off the computer and the monitor at the host workstation.

Stage 3. Loading New System Releases

Loading New System Releases

The process for loading new system releases is basically the same as the other restoration processes described here, except that you are working with the system disk (DP0) only. Documentation always accompanies any new system release tapes. When you receive a new system release, follow the accompanying documentation carefully.

Caring For Tapes And The MicroTICCIT System

All computer tapes should be kept in a cool, dry, and dust-free environment. They should also be kept in a safe place because they are your only backups for the system.

When you use a new tape (one right out of the package, you should always re-tension the tape to be sure the tape has proper tension. New tapes are often wound too tightly on the reel.) To re-tension a tape, go to the TICCIT/DOS MAIN MENU. Select Option 6: *Go to Tape/Backup/Restore Menu.* Press <RETURN>. Insert the tape. Select Option 8: *Re-tension Cartridge Tape.* Press <RETURN>. When the operation is complete, remove the tape. It is now ready to use.

The MicroTICCIT system needs very little care to keep it running for many years. The average site experiences uptime higher than 99% of the time. To be sure that your system runs with a minimum of downtime, you should do the following:

1. Always conduct a read and check procedure of the disk before and after loading tapes and each time you bring the system up. If any problems are reported by the read and check procedure, contact your Ford Aerospace customer service representative. Do not bring TICCIT up until all problems are resolved.
2. Keep food and drinks away from the equipment. Liquid or crumbs in the keyboard can cause it to malfunction.
3. The system operates well in normal office environments. If the temperature of the room is above 90 degrees or the humidity is at the point of condensation, shut the system down until normal conditions are restored.

Chapter 5: The MicroTICCIT Keyboard: Layout and Functions

This chapter describes the layout of the MicroTICCIT Keyboard. The various function keys and their operations are explained.

Contents:

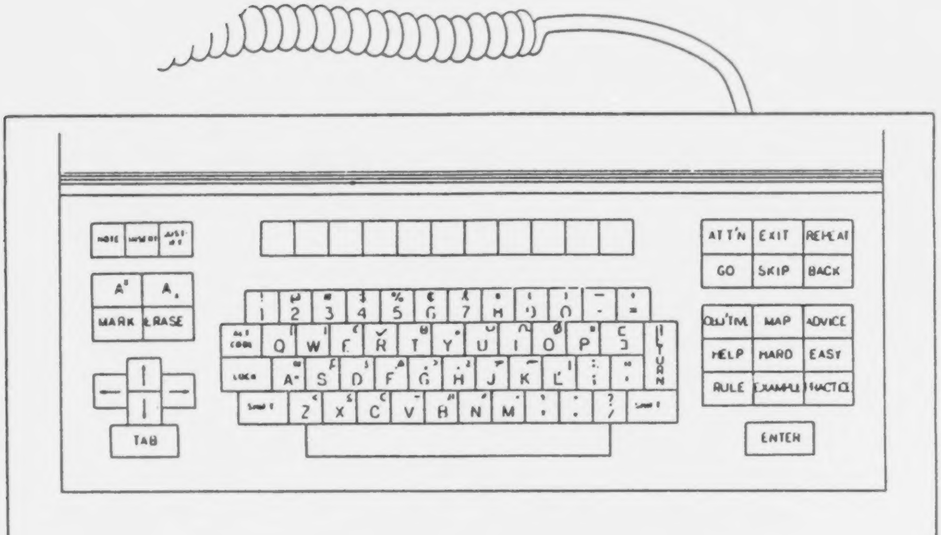
The Editing Keypad
The Center of the Keyboard
The Learner Control Keypad
Attention Functions
Proctor Functions

The MicroTICCIT Keyboard

The keyboards at the host workstation and at each of the student workstations are identical (see Figure 5.1). They are specially designed keyboards developed for students to use on the MicroTICCIT system. Many of the keys are the same as those found on other computer keyboards, but some are unique to MicroTICCIT.

The keys you and your students use are fully explained in the on-line lesson "Introduction to MicroTICCIT." The best way for you to learn your way around the system is to log on to this lesson and work through it. A brief discussion of the keys and their functions are discussed below.

5.1 MicroTICCIT Keyboard



The Editing Keypad

At the left side of the keyboard are three groups of keys. These keys form the editing keypad. They are explained below.

Press this:	To:
<NOTE>	Leave messages about the lessons on-line. Students may leave lesson-related messages for the instructor, and the instructor may leave messages about the lesson for the developers at Florida State University.
A* (superscript)	Raise selected characters above the baseline of the text. For example, the 2 in 3^2 is a superscript.
<MARK>	Have the same effect on the cursor as would touching the location with a light pen.
<ERASE>	Delete the entire line to the right of the cursor location.
Arrow Keys	Control the cursor. They move the cursor around the screen to the left, right, up, or down without erasing any characters the cursor passes over. They are especially necessary if a light pen is not working properly.
<TAB>	Move the cursor directly from one window to another. For example, when you log on to the system, you see three boxes: one for the password, one for the user ID, and one for the course number. <TAB> moves the cursor from one box to another.

The Center of the Keyboard

The keys in the center of the keyboard are arranged much like those on a standard computer keyboard. They are used for typing letters and numbers.

Press this:	To:
<SHIFT> with any letter	Get an uppercase version of that letter.
<ALT CODE>	Get the third symbol on the key cap.

Press this:	To:
<RETURN>	Conclude operations conducted in MicroTICCIT operations.
<Space bar>	Move the cursor one space to the right. Using the space bar to move the cursor into a space already occupied by any character deletes that character.

Above the center keypad is a row of unmarked keys. These are the standard function keys, often labelled Fl through Fll, found on most computer keyboards. They are special purpose keys and are not used in JSEP; therefore, you will not need to be concerned about these keys.

The Learner Control Keypad

The keypad at the right of the keyboard is called the Learner Control Keypad and is unique to TICCIT. These keys are used to respond to prompts that appear on the screen. Several of the keys are used for consistent purposes in JSEP. In general, moving from one display to another in JSEP is accomplished through use of the learner control keys.

Press this:	To:
<ATT'N>	Control a special group of functions called the Attention Functions. The Attention Functions are explained on-line if the user presses <ADVICE> after pressing the <ATT'N> key. These functions include:

<M>	Return to course map or menu.
<O>	(or type **OF** or **OFF**) - Log off TICCIT (save my results if I am registered as a student).
<P>	Proctor functions (not available to students).
<X>	Go to the standard TICCIT Student Menu (not the JSEP menu).
<C>	Access the calculator (available to students during lessons, but never in math tests).
<Y>	Answer Terminal-to-Terminal Communications.
<N>	Refuse to answer Terminal-to-Terminal Communications.

Press this:	To:
<EXIT>	Move up a level in the course or to leave the courseware.
<GO>	Move through a series of screen pages that are grouped into a single function.
<SKIP>	Go from the beginning to the end of a topic. <SKIP> can be pressed only when it is displayed as an option at the bottom of the screen. It is displayed at the beginning of a topic when an instructor is in reviewer mode.
<BACK>	Go to the beginning of the previous screen display.
<HELP>	Obtain help or information on how to answer a question that is presented on a screen display. <HELP> can be pressed when it is displayed as an option at the bottom of the screen.
<ENTER>	Conclude an operation and move to a new display. For example, after typing an answer to a lesson question, the student will usually press <ENTER>.

Attention Functions

Students have access to all functions except <ATT'N> <P>, which is described below. Both <ATT'N> <M> and <ATT'N> <O> can be used to exit a lesson before it is completed; however, only <ATT'N> <O> will save the student's data. <ATT'N> <M> will throw out the data since the student last logged on.

The following steps allow you to access any of the attention functions:

Accessing Attention Functions

1. Press <ATT'N>.
2. A message will appear saying, "ENTER THE COMMAND DESIRED." Press the key for the attention function you wish to access and press <ENTER>.

Proctor Functions

The proctor functions are a special group of attention functions which provide special access to the TICCIT system. For protection of the system, a password is required to gain access to them. Although there are many proctor functions in TICCIT, you will use only Proctor B in JSEP. Proctor B allows you to branch to any part of a lesson.

Complete the following steps to access any of the proctor functions:

Accessing Proctor Functions

1. Press <ATT'N>.
2. A message will appear saying "PLEASE ENTER THE COMMAND DESIRED." Press <P> and type your Proctor password. Then press <ENTER>.
3. Another message will appear saying "ENTER THE DESIRED FUNCTION." Type the letter of the function and press <ENTER>.

Chapter 6: Courseware Operations

Chapter 6 provides explanations and step by step procedures for Courseware Operations.

Contents:

- Logging On the System
- Logging Off the System
- Branching: How JSEP Lessons Are Organized
- JSEP Instructor's Menu
  - Register Students
  - Change Controls/Passwords
  - Student Progress Reports
  - Communicate with Students
  - Branch to Lessons

Logging On the System

To get onto the TICCIT system, TICCIT must be up and running, and the monitor and the computer must be turned on. The process for logging on is the same from the host and the student workstations. The monitor displays the TICCIT attention graphic.

To log on the system:

Logging on the System

1. Press <ATT'N> to get the log on display.
2. Type in your password. (The password is a four character code that is assigned to each registered user.) Your password is shielded on the screen. This is a security precaution to protect your password from others. The cursor automatically moves to the *USER ID* box.
3. Type in your identification number. (The identification number is a social security number or any other ID number used by the site, except for ID number 1.) If your ID number has fewer than 18 characters, press <TAB> or use the light pen to move to the next box. If it has 18 characters, the cursor moves automatically to the *COURSE* box.
4. Type the course number you wish to access and press <ENTER>.

NOTE: To correct an error, move the cursor to the error with the light pen or the cursor control keys and re-enter the correct information. Type over a wrong character to correct it.

When students log on to the system, they return to the display they left when they last logged off. The only exception is when students log off during a test.

Logging Off the System

Instruct users to log off the system whenever they will be away from their workstations even for a few minutes. This prevents anyone else from accessing their lessons or records.

Use the following procedure to log off the system:

Logging Off the System

1. Press <ATTN>. You will see the message "Please enter the command desired."
2. Press <O> or type **OF** or **OFF** (any of them will work). Press <ENTER>.
3. You are logged off when the attention display appears on the screen. The computer and the monitor can be left running unless you are shutting down for the day.

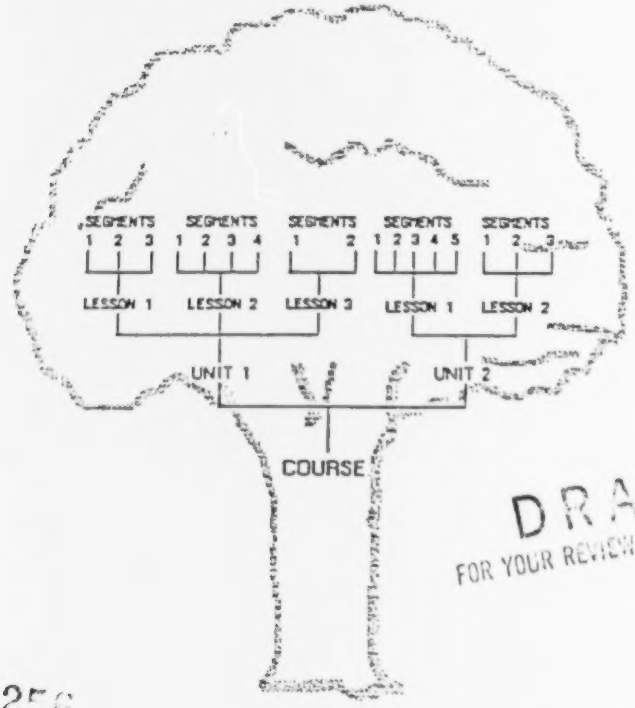
NOTE: If it is at all possible students should never log off during a test. The system automatically records a failed status if the student logs off before the test is completed. This is true even if the student has answered enough questions correctly to pass the test. The students are always warned they will fail when they try to log off during a test.

Branching: How JSEP Lessons Are Organized

TICCIT organizes the lessons in any course through a hierarchical structure (Figure 6.1). TICCIT branches lessons by Course, Unit, Lesson, and Segment (C.U.L.S.). These categories are related to each other in a hierarchy in which segments are grouped into lessons, lessons into units, and units into the course. The JSEP lessons are organized within this structure as follows:

- **Course:** JSEP itself
- **Unit:** the Prerequisite Competency (PC) number series
- **Lesson:** a letter within the PC series
- **Segment:** one of the following: Diagnostic Review Lessons (DRL), Skill Development Lessons (SDL), and Test (Figure 6.2).

Figure 6.1 MicroTICCIT C.U.L.S. Tree Structure



DRAFT
FOR YOUR REVIEW AND COMMENT

6.2 Correspondence Between JSEP Prerequisite Competencies (PC) Codes and MicroTICCIT Course Unit Lesson Segment (C.U.L.S.) Codes

JSEP Lessons / TICCIT CODE Correspondence Table

PC	Unit	Lesson	Segment *	PC	Unit	Lesson	Segment *	PC	Unit	Lesson	Segment *	PC	Unit	Lesson	Segment *
01A	11.	1		07C	17.	3		15G	15.	22		29B	29.	2	
01B	11.	2		07D	17.	4		15H	15.	23		29C	29.	3	
01C	11.	3		07E	17.	5		15I	15.	24		29D	29.	4	
01D	11.	4		08A	18.	1		15J	15.	25		29E	29.	5	
01E	11.	5		08B	18.	2		16A	16.	16		29F	29.	6	
01F	11.	6		08C	18.	3		16B	16.	17		30A	30.	1	
01G	11.	7		08D	18.	4		16C	16.	18		30B	30.	2	
01H	11.	8		08E	18.	5		16D	16.	19		30C	30.	3	
01I	11.	9		09A	19.	1		16E	16.	20		31A	21.	16	
02A	12.	1		09B	19.	2		16F	16.	21		31B	21.	17	
02B	12.	2		09C	19.	3		16G	16.	22		31C	21.	18	
02C	12.	3		09D	19.	4		16H	16.	23		31D	21.	19	
02D	12.	4		09E	19.	5		17A	17.	16		31E	21.	20	
02E	12.	5		10A	20.	1		17B	17.	17		32A	22.	16	
02F	12.	6		12A	12.	16		17C	17.	18		32B	22.	17	
02G	12.	7		12B	12.	17		18A	18.	16		32C	22.	18	
03A	13.	1		12C	12.	18		18B	18.	17		32D	22.	19	
03B	13.	2		12D	12.	19		18C	18.	18		32E	22.	20	
03C	13.	3		12E	12.	20		19A	19.	16		34A	24.	16	
03D	13.	4		12F	12.	21		19B	19.	17		34B	24.	17	
04A	14.	1		12G	12.	22		19C	19.	18		34C	24.	18	
04B	14.	2		12H	12.	23		19D	19.	19		34D	24.	19	
04C	14.	3		13A	13.	16		26A	26.	1		36A	26.	16	
04D	14.	4		13B	13.	17		26B	26.	2		36B	26.	17	
04E	14.	5		13C	13.	18		26C	26.	3		36C	26.	18	
04F	14.	6		13D	13.	19		26D	26.	4		36D	26.	19	
05A	15.	1		13E	13.	20		26E	26.	5		36E	26.	20	
05B	15.	2		14A	14.	16		26F	26.	6		36F	26.	21	
05C	15.	3		14B	14.	17		26G	26.	7		36G	26.	22	
05D	15.	4		14C	14.	18		27A	27.	1		36H	26.	23	
05E	15.	5		14D	14.	19		27B	27.	2		40A	30.	16	
05F	15.	6		14E	14.	20		27C	27.	3		40B	30.	17	
05G	15.	7		14F	14.	21		27D	27.	4		40C	30.	18	
05H	15.	8		14G	14.	22		27E	27.	5		41A	21.	1	
05I	15.	9		15A	15.	16		27F	27.	6		41B	21.	2	
06A	16.	1		15B	15.	17		27G	27.	7		41C	21.	3	
06B	16.	2		15C	15.	18		28A	28.	1		41D	21.	4	
06C	16.	3		15D	15.	19		28B	28.	2		41E	21.	5	
06D	16.	4		15E	15.	20		28C	28.	3		41F	21.	6	
07A	17.	1		15F	15.	21		28D	28.	4		41G	21.	7	
07B	17.	2						29A	29.	1		41H	21.	8	

42A 22. 1

* SEGMENT KEY			
0=Lesson Router	1-4 DRL	5-14SDL	15=Test

Branching refers to the way the system moves from one lesson to another and from one subdivision to another within the lesson. Branch to any lesson in the course by either selecting Option 5 in the JSEP Instructor Menu or by using the Proctor B function. Proctor B is useful if for some reason the student gets stuck at a certain point in the lesson and cannot move on. Remember that using Proctor B will almost always override coding, and the lesson you move to may not function as it was designed, so limit its use to emergencies.

To use Proctor B, press <ATT'N>, and then press <P>. Type in the Proctor password and press <ENTER>. Now press <B> and press <ENTER> again. Refer to the JSEP/MicroTICCIT Correspondence Table (Figure 6.2) to determine which PC lesson you are in. If you are doing this on a student log on, you should stay within the lesson. For example, if a student is stuck in lesson 1A, location [11.1.1] subdivision [1/2], you could use the Proctor B function to branch to subdivision [2/1] which would bypass the point where the student is trapped.

NOTE: If you are on your instructor log on, you can branch to an entirely new lesson by using the JSEP/MicroTICCIT Correspondence Table (Figure 6.2). When branching to a completely new segment (part of a lesson), always use subdivision "1/1" to set variables for that lesson.

If you are on the student log on (mode "S" in MicroTICCIT registration), use the Proctor B function to discover a student's location in a lesson or to get him or her out of a problem area. Finally, it should be noted that the system can only keep track of where the student has been if he or she follows the lesson as it was programmed and has hit all the checkpoints.

Use the branching function with caution and only after you have tried to get the student out of the problem spot another way.

JSEP Instructor's Menu

The JSEP Instructor's Menu offers an organized and systematic access to a large array of TICCIT and JSEP functions, including registering a student for JSEP, maintaining the computer's security features, managing progress data and demographics, communicating with other terminals, and accessing individual JSEP lessons.

Complete the following steps to access the Instructor's Menu:

Accessing the Instructor's Menu

1. Log on to Course 146 (the Civilian JSEP course number).
2. Press <HARD> to access the JSEP Instructor's Menu.

   NOTE: Pressing the <HARD> key while in a lesson will not access the JSEP Instructor Menu.

3. Type the JSEP password and press <ENTER>.

The JSEP Instructor's Menu lists five options:

- Register Student
- Change Controls/Passwords
- Student Progress Reports
- Communicate with Students
- Branch to Lesson

These options and the tasks they allow you to perform are described here.

Figure 6.3 shows the five options available on the Instructor's Menu as well as the submenu options for each.

6.3 JSEP Instructor's Submenus

1 - Register Student

1. Make Record (TICCIT Registration)
2. Enter/Edit Information on Record
3. Create Prescription
4. Modify Prescription

2 - Change Controls/Passwords

1. Learner Strategies Control
2. Series or Lesson Completion Control
3. JSEP Password
4. Proctor Password
5. JSEP User Mode Control

3 - Student Progress Reports

1. TICCIT Reports
    1. Build Class Roster
    2. Update Class Averages
    3. Unit/Lesson Class Report
    4. Unit/Lesson Individual Report
    5. Course Report (Class)
2. See/Edit a Student's Progress Data
3. Create Student's Test Log Report; Print and Delete
4. DUMP Test Log Data
5. Delete Student Test Data

4 - Communicate with Student

1. TICCIT Mailbox
2. Monitor Student
3. Terminal to Terminal
4. Broadcast Message
5. Terminal Status Display

5 - Branch to Lesson

1. Branch by PC Number/Letter
2. Special Branch
    - Demonstration Package
    - Learner Strategies
    - C.U.L.S.

Option 1. Register Student

Before students can "log on" or study any lessons, they must be registered. This means:

- Giving TICCIT the students' registration number. This may be the students' social security number or any other numerical identification system used by the school.
- Entering demographic data about students (name, test records, grade level, etc.).
- Creating the students' prescription; that is, the set of lessons they will study.

This process is necessary for tracking the students who use JSEP and for monitoring how well they perform. The records help assess how well a student does in a prescribed course, as well as in evaluating the course itself.

The Register Student option provides access to four functions. These functions are described here, along with step by step instructions for registering a student.

The four functions are:

- Make Record (TICCIT Registration)
- Enter/Edit Student's Demographic Data
- Create Prescription
- Modify Prescription (use only on student's log on)

Make Record (TICCIT Registration)

This is the first step in the process. It creates a new student record, or Permanent Data Area (PDA) in TICCIT. The PDA is used to store all of the student performance data generated as students work their way through the JSEP lessons.

Complete the following steps to register students onto the TICCIT System. (Refer to Figure 6.4 and Figure 6.5 as you study this process.)

Making a Student Record

1. Log on to JSEP Course 146.
2. Access the JSEP Instructor's Menu.
3. Access the Register Student Menu.
4. Select Make Record (TICCIT registration) option.
5. Select the Interactive Registration option and press <ENTER>.

Instructions for making the student's record are displayed as are the instructions for all of the following registration activities. If you need further information, press <ADVICE> when you are on the *Interactive Registration* display. It will give you on-line help with the process.

6. Type <1> (one) in the *ACTION* box to add a student.
7. Enter the student's social security number or the number assigned to the student, without any dashes or spaces, in the *USER ID* box.
8. Enter the student's name in the *NAME* box: last name, first name, and middle initial. (Type a , after the last name and include a space after the comma.)
9. Enter the first four letters of the student's last name or another password selection in the *PASSWORD* box. Use either upper or lower case letters. Each time the student logs on the system, he or she must type the password exactly as you have registered it here.

10. Type <S> (for student) in the *MODE* box. [Type <U> (for unforced) to register as an instructor, visitor, or operator. The system will not record the progress data when you log off.]

11. Type **146** (for JSEP) or **101** for the demonstration in the *COURSE* box. (Type **50** for the Army course; type **100** for the Army demonstration.)

    NOTE: Course 101 should be used only when you are registering visitors and instructors. Do not register students for Course 101. Course 101 is also accessible from the Special Branch option in the Branch to Lesson menu.

12. Type the class section number in the *SECTION* box. Develop a two digit coding system (01-99) to assign students to a section. The Student Management System (SMS) uses section numbers to generate statistics and reports, so you should develop a system for assigning section numbers that meets your needs. You might, for example, have all students with the same occupation in the same section.

13. Press <TAB> to go to the *CODE* box. Type **ST** for students and visitors, or **SY** for instructors. Type **177777** for operators. Then press <ENTER>. A message appears that says "Operation Successfully Completed." Press <EXIT> twice.

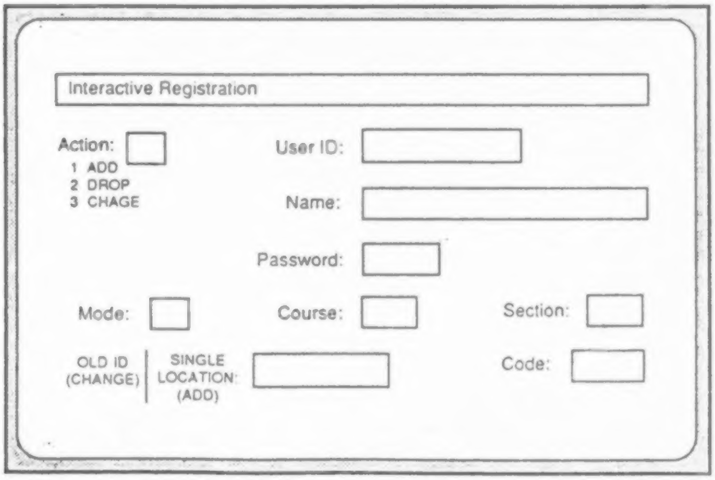
6.4 MicroTICCIT Registration Table

PERSON TO REGISTER	USER ID	NAME	PASSWORD	MODE	COURSE	SECTION	CODE
Student	Social Security number or another appropriate number	Last, First, MI.	4 letters	S	146	01-97 (a)	ST
Instructor and to register students	Social Security number or another appropriate number	Last, First, MI.	4 letters	S S	146 50	99	SY
Visitor	number 201, 202, 203, ... 215(b)	Last, First, MI.	Leave Blank	U	50 100 101 146	99	ST
Operator and to review lessons	Social Security number or another appropriate number	Last, First, MI.	4 letters	U	0 50 100 101 146	99	177777

(a) Develop a 2-digit coding system (01-99) to assign students to a section. The Student Management System uses section numbers to generate statistics and records. Instructors should develop a system that willl meet their site's needs.

(b) Create a generic logon for each terminal. For example, 201 could be used to log on to terminal number 1; 202 for terminal number 2, and so on. Be sure to use numbers that you are not using for students.

6.5 The MicroTICCIT Registration Screen Display is accessed through Interactive Registration. Use the <TAB> key to move around in this display.



Enter/Edit Student's Demographic Data

The second step is to record demographic information about the student. This information includes:

Student Demographic Information

- Part 1: Personal Information -- Name, nickname, date of birth, social security number, sex, and race.
- Part 2: Vocational Information -- Date enrolled, class, JSEP track (occupational title).
- Part 3: Educational Information -- Education level, GED status, TABE scores, and Locator scores. Additional information, such as reasons for enrolling in JSEP and improvement goals for JSEP, may be collected but not put into the Student Management System.
- Part 4: JSEP Operating Controls -- Give Learner Strategies Lessons.
- Part 5: Learner Strategies Lessons -- When each is required.

Enter as much of this information as possible before going on to the next step of the process. Information can be changed if necessary.

Assigning Learner Strategies

You can assign Learner Strategies in two ways: During Enter/Edit Student's Demographic Data when you are first registering the student, or through the Learner Strategies Control option after the student has been registered and has completed the Introduction to MicroTICCIT. The Learner Strategies Control option is described later in this chapter under Option 2: Change Controls/Passwords. The instructor (possibly in consultation with the job counselor and student) chooses modules for each student. Selected modules may be assigned:

- By the instructor when the prescription is created;
- By the instructor after observing that a student would benefit from a module; or
- By the computer after a student has demonstrated a need for a selected module.

The default selection of Learner Strategies appears in Part 5: Learner Strategies Modules under Enter/Edit Student's Demographic Data. The default selection can be changed by the instructor but only when the student is initially being registered. There are three options: Before the prescription, during the prescription, or never. The instructor can choose to leave the defaults if they seem most appropriate.

Create Prescription

JSEP is designed so that the student will not have to take every lesson in the course. Instead, the Student Management System selects those lessons which will benefit the student the most in job training and automatically routes him/her through them. This individualized course is called the prescription. The prescription is made on the basis of either job training requirements or a custom set of requirements.

Prescriptions may be modified on the student's log on.

Creating Prescriptions

Create the prescription by selecting one of two options:

- JSEP track (occupation title)
- Custom

The JSEP track (occupational title) is a preprogrammed set of lessons labelled as an alphanumeric code. (See Appendix A for a listing of lessons by JSEP track and alphanumeric code.) To use this option, the alphanumeric code must have been entered under Enter/Edit Student's Demographic Data.

The Custom option allows the instructor to create a custom-made prescription for a student by modifying one of the four Custom prescription templates.

The Option A template lists all of the JSEP lessons on the system. The instructor may delete lessons from this template that were not selected for the custom prescription by logging on to the system with the student's logon and selecting the Modify option.

Option B, the "No lessons" template, allows the instructor to select lessons and add them to a blank template.

The Option C template lists all math lessons.

The Option D template lists all verbal lessons.

Modify Prescription (use only on student's log on)

In the Custom prescriptions, you can add and delete lessons at will. Modifying the prescription will not alter students' performance data in any way. The prescription determines which lessons *will be* taken, while performance data are collected on those lessons which *have already been* taken.

Do not attempt to delete a lesson while students are in it, or if they have already completed it. If for some reason you need to delete a lesson that *can* be deleted (those that have been added to a prescription template or created as a custom prescription), use the ABORT option or use the See/Edit Performance Progress Data Option under Option 3: Student Progress Reports. Turn the lesson to be deleted black (B), score to 0, tries to 0. The completion/pass/fail status color code will be discussed along with the See/Edit Progress Data option under Student Progress Reports.

Use the Modify option available from the student log on to add or delete lessons created from the Custom prescription.

NOTE: At this point you have successfully completed student registration and prescription assignments. Once the students are registered for both TICCIT and JSEP and the prescriptions are made and modified as needed, further intervention with the students' prescriptions should be unnecessary. Further instructor intervention only distorts the students' progress data.

Option 2: Change Controls/Passwords

TICCIT and JSEP use several controls and passwords to tailor lessons to students' needs and ensure system security. Most of these controls are set when you register the student; however, this option allows you to modify these controls. This option also provides for setting passwords which restrict access to both TICCIT and JSEP functions, specifically those which pertain to the Permanent Data Area. Students who gain access to these could alter or destroy important data.

Keep passwords secret. Change them once a week and every time you suspect someone is attempting to discover what they are.

The five functions accessible through Change Controls/Passwords are:

- Learner Strategies Control (use only on student's log on)
- Series or Lesson Completion Control (use only on student's log on)
- JSEP Password
- Proctor Password
- JSEP User Mode Control (use only on student's log on)

Each of these will be discussed here.

NOTE: This system uses three different passwords. The passwords set through this option are the Proctor and JSEP passwords, but not the student or instructor log on. Refer to the note on passwords later in this chapter.

Learner Strategies Control (use only on student's log on)

This option is used to turn the Learner Strategies Modules on or off **after students have started their prescriptions**. This option must be used on the student's log on only.

A complete description of the Learner Strategies Modules is found in Appendix C. Guidelines for how and when to use them are found in Chapter 3 of this handbook. Instructors can set the Learner Strategies Controls either when the demographic file is created, or whenever they believe that students would benefit from studying one or more of the modules.

Note that different menus are used for each case. Do not attempt to change a module while students are actually working in a lesson. You may confer with the students or with their counselor in determining the need to prescribe any of the modules. If students fail a preset number of lessons, the system will automatically prescribe and activate certain appropriate modules.

Series or Lesson Completion Control (use only on student's log on)

Use this option to allow students to stop working on or to abort the current lesson or series. When a series or lesson is aborted it remains in the students' prescriptions. The aborted series or lesson will have to be completed at a later time. This option must be used on the student's log on only.

JSEP Password

This option allows you to establish a JSEP password, required for performing JSEP-specific instructor-only functions. Instructor-only functions include allowing the student to take a particular lesson test more than three times and accessing the Instructor Menu. Any log on may be used for this option.

If students learn the JSEP password, they can access the Instructor's Menu and alter or destroy important data. Therefore, **keep passwords secret and change them often.**

Proctor Password

This option allows you to establish a Proctor password, required for performing TICCIT-specific instructor-only functions. These include the Proctor functions discussed in Chapter 5.

Any log on may be used for this option. If students learn the Proctor password and attempt to perform these functions, they could alter or destroy a good deal of important data. Therefore, **keep passwords secret and change them often.**

JSEP User Mode Control (use only on student's log on)

TICCIT presents the JSEP lessons in two modes, each of which allows access to a particular set of information and options.

The JSEP User Mode Control option allows you to select the mode in which the lesson will be viewed. This option must be used from the student's log on. Each mode is discussed below.

Student Mode

Students study the lessons in this mode. It contains no special information or options; it presents only the lesson and allows the student to interact with the practice and test items.

Reviewer Mode

This mode gives or highlights correct answers and allows the reviewer to back up in tests. Occasionally, visitors use this mode to view entire lessons. Most visitors view the JSEP demonstration package, which presents a representative sample of JSEP coursework. The demonstration package is accessed by logging on to Course 101. Students' progress is not recorded.

6.6 Correspondence Between JSEP Prerequisite Competencies (PC) Codes and Paper Lesson (C.U.L.S.) Codes

JSEP Paper Lessons / TICCIT CODE Correspondence Table

07E	17.	5
11A	11.	16
11B	11.	17
*19B	19.	17
25A	25.	1
25B	25.	2
25C	25.	3
25D	25.	4
25E	25.	5
25F	25.	6
*27G	27.	7
*28B	28.	2
*28C	28.	3
*29F	29.	6
*32D	22.	19
33A	23.	16
33B	23.	17
33C	23.	18
33D	23.	19
35A	25.	16
35B	25.	17
35C	25.	18
35D	25.	19
35E	25.	20
35G	25.	22
35H	25.	23
35I	25.	24
*36G	26.	22

*These lessons are computer and paper based.

Option 3: Student Progress Reports

Student Progress Reports provide the following options:

- TICCIT Reports
- See/Edit a Student's Progress Data (use only on student's log on)
- Create Student's Test Log Report; Print and Delete
- DUMP Test Log Data
- Delete Student Test Data

Each of these will be discussed here. Samples of the TICCIT Reports and the Test Log can be found in Appendix D.

TICCIT Reports

TICCIT is configured to generate several types of reports from the students' performance data, and the TICCIT Reports option allows you to access these functions directly. Reports for an individual student or for an entire section can be printed and displayed on the screen.

The correspondence between Prerequisite Competencies (PC) codes and Course Unit Lesson Segment Codes (C.U.L.S.) for paper lessons are shown in Figure 6.6.

Since TICCIT Reports are specific to TICCIT and not JSEP, the reports are of a general nature and do not use PC numbers (Prerequisite Competencies), but rather C.U.L.S. codes. To decipher which lesson you are looking at or the lesson you wish to report on, refer to Figure 6.2 for on-line lessons and to Figure 6.6 for paper lessons.

There are three types of reports: Unit/Lesson Class Report, Unit/Lesson Individual Report, and Course Report (Class). Each type of report is described below along with two functions, Build Class Roster and Update Class Averages, that develop these reports.

Build Class Roster

A class roster contains the names of students who are in the same group, or "section," as it is called in the TICCIT registration. The class roster must be built before the other TICCIT report functions can be used. Since JSEP is designed to allow for a broad range of prescriptions, the class or section should not be based on students who are in the classroom at one particular time. Since each student will be working on an individualized sequence of lessons, the class roster should consist of all the students whom you choose to group in one section. To do this, type the JSEP course number (146) and the section number you will be using for this purpose. You may choose to set up sections by prescription type or by some special categories for collecting data. Because instructors and visitors do not register with a section number, their data will all go into Section 0 by default.

Update Class Averages

The Update Class Averages option computes averages for all the students in the same section. These averages appear on the TICCIT reports for both class and individuals. Keep in mind that "class" and "section" are synonymous terms. To use this option, type in the JSEP course number (146) and the number of the section for which you want the reports.

Unit/Lesson Class Report

Unit/Lesson Class Report shows students' performance data for every lesson in a JSEP unit and for every student in a given section. Data shown for each student include the TICCIT location of the lesson, score, pass/fail status, time in the lesson, and number of test attempts. The report also shows class averages. How TICCIT organizes the JSEP lessons is discussed in this chapter under the heading of Branching: How JSEP Lessons are Organized.

Unit/Lesson Individual Report

A Unit/Lesson Individual Report shows the same data as the Unit/Lesson Class Report, but for a single student only. The student's performance data can be compared with the class average, also shown in this report.

Course Report (Class)

A Course Report (Class) gives the total time on the computer for every student in a given section. It also shows the total number of lessons each student passed, the number remaining to be passed, and class averages for time and lessons passed. The number of lessons passed is **not** related to the student's prescription.

The TICCIT reports are explained in detail in the TICCIT reference materials that accompany your system. There is also on-line ADVICE for using these reports. To access the ADVICE, go to the report you wish to use and press <ADVICE>.

See/Edit a Student's Progress Data (use only on student's log on)

This option takes you into the Student Management System (SMS) via the Edit Mode, and allows you to view students' performance data along with lesson titles. This option must be used from the student's log on only. The display for this mode shows all lessons in the prescription in a color code that designates the completion/pass/fail status of each lesson in the prescription. In this code,

- ***black*** indicates a lesson not yet attempted;
- ***yellow*** indicates a lesson in progress;
- ***red*** indicates a failed lesson; and
- ***green*** indicates a lesson passed.

This option allows you to make changes in the performance data if, for some reason, the data are no longer correct. This is done by changing the color status of the lesson. An example of such a case would be deleting a lesson from the student's prescription.

NOTE: Use this option only when necessary. Remember that the less instructor intervention there is, the more accurate the reports will be. Before deleting a lesson, you need to change the pass/fail status of the lesson to black (B), that is, "0 score, 0 tries."

Create Student's Test Log Report; Print and Delete

The JSEP test log PROGRAM collects JSEP-tailored information on the students' performance on tests. The test log program stores the results of approximately 65 test attempts for each registered student, depending on which test the student is taking. When the test log is almost full, a message appears on the students' screen. It is essential to transfer the information in the test log to a file on the hard disk within three or four additional test attempts or the system will most likely start giving the student error messages and student test data will be lost.

To use this utility, do the following: From your own log on, select this option. In the RESPONSE box (R-box) titled ID Number, type in the student's ID number and press <ENTER>. The number will then be padded with 0's to create a ten-digit number with the extension ">TR>" This number and the extension will be the name of the disk file. For example, if a student's ID

Number is 123456789, the test log report name will be 0123456789.TR.

Student data can be transferred to a disk file whenever a hard copy of a student's performance data is needed. It is best to print out data frequently. This approach eliminates the "have-to" situation, which occurs when the test log is full.

After students' performance data have been transferred to the disk file, the data can be printed. From the screen that says a file has been created, press <ENTER> to access the print screen. Press <HARD> to print and delete the report that was just created. This will print the Test Log Report and delete the print list. If the student's data area is full and the data in it are internally consistent, it will also delete the student's test records from the system and leave the data area empty and ready for the next set of the student's test records. If the student's data area is not full, it will not delete the student's test record. It will simply provide a printed record. If you wish to empty the student's test record data area at that point, you will have to use the Delete Student Test Data option described below.

The next display screen after the print screen will give you the options of leaving the report generator or of transferring another student's test log. Follow the instructions provided on that screen.

If for any reason your printer is not available when you must clear a student's test record data area, you can create the test record listing and save it on the hard disk to print when you have a printer available. This will allow the student to continue to take tests after you have cleared the student's test record data area. To store the records without printing them, go to the print display and select <EXIT> instead of <HARD>. The data will be stored for later printing.

Dump Test Log Data

If the student had internally inconsistent test data in the file, the DUMP Test Log Data procedure will print a dump file version of the Test Log Report but will not delete the student's data area whether the file is full or not. You will know when a student's file contains internally inconsistent data because the Test Log Report you printed from the Create Student's Test Log Report; Print and Delete option will contain the following message immediately after the last line of consistent data:

> This Test Log printout is incomplete for this student. Bad data were found in the student's Test Log data area after the material shown here. The data above are good data.

A message will also appear on-line before you print. If this message appears on a student's printout or on-line, you should immediately select and use the DUMP Test Log Data option. That will permit you to print a record of all of the student's test scores for the tests taken. You will then have to clean out that student's files so that the internally inconsistent data can be removed from the disk. Although the data on the DUMP report will not be as convenient to use as the Test Log Report since it is a dump file, it will provide you with correct and usable results of the student's performance on the tests. The screen displays explain how to use the DUMP option and how to interpret the resulting printouts of the student's data. The DUMP option will not delete students' data from the system, so your next step will be to delete the data.

Delete Student Test Data

If you have just printed students' test data, either from the DUMP Test Log Data option or from the Create Student's Test Log Report; Print and Delete option, and you want to delete the records in that student's data area, select the Delete Student Test Data option. Remember that there are only two occasions when you might want to or have to do this. First, you may want to use this option when you have printed out consistent data but the student's file was not full and therefore not deleted. In this case, you are choosing to provide more room on the system. Second, you have to use this option to clear out the student's files when you have printed inconsistent data by using the DUMP option, since you want to clear the file before the student takes any more tests. In this second case, if you do not clear the file, you will not be able to print the easy-to-interpret Test Log Reports for that student.

When you access the Delete Student Test Data option, you will get a warning that the student's record will be deleted. Be sure never to use this option until after you have printed the student's data either through the Create Student's Test Log Report; Print and Delete or through the DUMP Test Log Data. Otherwise you will never be able to recover the student's test records. To use this option, follow the instructions on the display screen.

Samples of TICCIT reports and the Test Log Report with explanations for interpreting them can be found in Appendix D.

Option 4: Communicate with Student

This option allows access to a group of TICCIT operating functions, which are also available in Course 0. These functions allow communication between the terminals in the network and are used to send messages to students and to monitor their activities. They include:

- TICCIT Mailbox
- Monitor Student
- Terminal to Terminal
- Broadcast Message
- Terminal Status Display

Each of these options will be discussed here.

TICCIT Mailbox

Users receive messages through their own TICCIT mailbox. If users have messages in their mailbox, TICCIT informs them by displaying a message on the screen when they log on. This function can be used to send a message which users can refer back to at a later time, since it remains on the system for as long as the user determines it should remain. The mailbox is also useful because the instructor can send a message to any student at any time, regardless of whether the student is currently logged on. Any mailbox message can be sent to one user or to a list of users.

Monitor Student

This function is used to see what actually appears on a student's screen by making it appear on the instructor's screen as well. This is useful for giving a student extra assistance or for monitoring his or her progress.

Terminal to Terminal

Terminal to terminal communications allows you to send a message to any student who is currently logged on. It works very much like two-way radio communication. If the student agrees to the link, messages can be sent back and forth until either party decides to end the exchange. The messages from one party appear in yellow on the top half of the screen; those of the other party appear in blue on the bottom half. The receiver of the message has the option to press <ATT'N> and then <Y> to receive a terminal to terminal message, or to Press <ATT'N> and then <N> to decline.

Broadcast Message

This function sends a single message to every terminal that is currently turned on. Broadcast Message also sends a message to all users logged on or to a specific user or to a specific terminal or to all users in a specific course. The message can also be resent automatically every 30 seconds by pressing <GO>.

Terminal Status Display

The Terminal Status Display presents a matrix of all terminals, showing the on/off status and where the user is for each terminal. By pressing <OBJ'TIVE>, you can get to a display that shows additional information about a specific terminal and the user who is on it. <GO> takes you forward and <BACK> takes you backward through each of the terminal numbers. To see who is on a given terminal, type its number in the *TERM* box and press <ENTER>. To return to the terminal matrix, press <EXIT>. The Terminal Status Display is also discussed in Chapter 4 under the TICCIT Shutdown Procedures.

NOTE: These communications features are more fully explained in the on-line ADVICE function in TICCIT. To access ADVICE, go to the feature you wish to use and press <ADVICE>.

Option 5: Branch to Lesson

This option is used only by instructors and visitors. It provides the instructor with an easy way to branch to any lesson without having to select it in the course route. However, you should never allow students to use this method of accessing lessons, as it will circumvent the coding discussed under See/Edit a Student's Progress Data. There are two ways to use this option:

- Branch by PC Number/letter
- Special Branch
    - Demonstration Package
    - Learner Strategies
    - C.U.L.S.

Both ways are discussed here.

Branch by PC Number/Letter

Each JSEP lesson has its own Prerequisite Competency (PC) code, which consists of the series number followed by the letter designating a given lesson. A lesson is often recognized by its PC designation. For example, the lesson titled "Multiply and Divide Whole Numbers" has the PC code 13a and may be referred to as Lesson 13a. This option allows you to access any lesson by simply entering its PC code. For a list of each PC code by lesson in the JSEP course, refer to Appendix C. After typing the PC code, you can press one of two keys. Pressing <ENTER> will put you in Reviewer mode (answers will be given), and pressing <EASY> will put you in Student mode (no answers will be given).

Special Branch

This option allows you to access the demonstration package by typing **DEMO**. Any of the five Learner Strategies Modules can be selected from this option as well. Type **MST** for Motivational Skills Training, **TM** for Time Management, **PS** for Problem Solving, **RS** for Reading Strategies, or **TST** for Test-Taking.

As mentioned earlier, the letters C.U.L.S. stand for Course, Unit, Lesson, Segment, which refers to TICCIT's tree structure for organizing lessons. This option allows you to access the "Introduction to MicroTICCIT" lesson by typing **INTRO**. For a description of how the JSEP PC system is organized within the TICCIT C.U.L.S. structure, refer to Branching: How JSEP Lessons Are Organized, at the beginning of this chapter.

When you use the Special Branch option, you will see all the options listed above. The code you need to type to access what you want to see appears in blue. As on Branch by PC (Option 1), after typing the desired lesson you can press one of the two keys. Pressing <ENTER> will put you in Reviewer mode (answers will be given), and pressing <EASY> will put you in the student mode (answers will not be given).

Chapter 7: Evaluation

This chapter offers some suggestions for the evaluation of the JSEP program within a specific setting. An explanation of how evaluation is designed as part of the JSEP system is provided along with descriptions of alternative evaluation procedures.

Contents:

Evaluation Questions
Built-in Evaluation
Other Methods of Evaluation (Optional)

Evaluation Questions

Evaluation of JSEP may be conducted to measure the efficiency of the program and to investigate the following questions:

- Do students complete their basic skills studies faster?
- Is it cost effective?

Evaluation may also be used to assess effectiveness:

- Is material learned better?
- Are students who have gone through JSEP more successful in vocational programs?

Built-In Evaluation

The JSEP system is currently designed to measure success at the lesson level. When students pass all of the lessons in their prescription they are graduated from JSEP and are ready to begin vocational training in their job specialty. This assessment tool is built into JSEP and functions as an evaluation of student progress.

Other Methods of Evaluation (Optional)

The JSEP Common Test, which accompanies the JSEP package, is another assessment tool which can be used as a source of pre- and posttest data. This test measures achievement of skills covered by JSEP lessons. If this method is used, the instructor should include only those items on the test that cover material the student studied in his or her particular prescription. Pre- and posttest measures can be compared as a measure of basic skills improvement.

Most JSEP users will be interested in how students feel about JSEP instruction. The vast majority of participants who have been through JSEP have reported a high level of satisfaction with the lessons and high motivation while receiving instruction. Instructors and administrators could collect information about students' attitudes toward JSEP throughout their program of study.

Another valuable source of information is anecdotal information. Anecdotal information can easily be collected using MicroTICCIT's NOTE feature (described in Chapter 5). Instructors and students are urged to use this feature to record any typographical errors they find or to make general comments about lesson difficulty. When the notes are printed, they can be sorted by location, date, student I.D., or student name. This feature is an invaluable source of information for both instructors and lesson designers.

The long-term success of JSEP students is probably the area of greatest interest. Instructors and administrators are urged to collect data on JSEP students and students who are not exposed to JSEP. This information can be used to answer questions about the success of JSEP versus non-JSEP students in completing their vocational programs, their performance within programs, and even their on-the-job achievements.

Evaluation methods must fit the needs of the instructors in a particular setting. This is just a partial listing of the many ways in which the success of JSEP and the achievement of individual students can be measured.

Appendix A: Prescriptions for 20 Occupations

Appendix A contains the JSEP prescriptions that were built for 20 civilian occupations. Under each occupation is a list of lessons that comprise the prescription for that occupation. Also included is the alphanumeric code for each occupation. This code is used when demographic information is entered for each student and when prescriptions are created.

Occupational Title: ACCOUNTING CLERK
Occupation Code: A01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06C: Interpret Spatial Relations

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

19B: Use a Table of Logarithms to Solve Multiplication and Division Problems

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language
26F: Recognize Radio and Navigation Terms

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables
28D: Use Troubleshooting Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

30A: Identify the Meaning of Symbols on a Flow Chart
30B: Use Flow Charts to Make Decisions

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences
33D: Record Information in More Advanced Situations

34A: Identify Major and Subordinate Topics
34B: Write Titles Using Main Ideas
34C: Select Appropriate Details for Main Ideas
34D: Label the Parts of an Outline

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35G: Report Writing - Summarize Events
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects

Occupational Title: AUTO-BODY REPAIRER
Occupation Code: A02

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02D: Identify Measures of Weight, Pressure, and Torque
02E: Identify Measures of Volume and Capacity
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05F: Match a Gauge Reading to a Specification
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles
09C: Identify Types of Triangles
09E: Label Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15B: Match Geometric Figures with Their Word Names
15F: Compute Area and Perimeter of a Rectangle
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids
15I: Use Formulas to Solve Problems Involving Geometric Figures

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information

28A: Find Information in Two-Column Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

32A: Find Parts on a Form
32E: Locate and Compare Facts on a Form

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action

Occupational Title: BOOKKEEPER
Occupation Code: B01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks

04A: Interpret 24 Hour Time
04C: Estimate Time in Seconds and Minutes

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12E: Add or Subtract Military Time
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15F: Compute Area and Perimeter of a Rectangle

16B: Compute Averages
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List

30A: Identify the Meaning of Symbols on a Flow Chart
30B: Use Flow Charts to Make Decisions

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: CARPENTER
Occupation Code: C01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02D: Identify Measures of Weight, Pressure, and Torque
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05D: Read and Interpret Scales with Positive and Negative Markings

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles
09C: Identify Types of Triangles
09D: Draw Bisectors of Angles and Altitudes of Triangles
09E: Label Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15A: Draw Plane Geometric Figures
15B: Match Geometric Figures with Their Word Names
15C: Identify Parts of Geometric Figures
15F: Compute Area and Perimeter of a Rectangle
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids
15I: Use Formulas to Solve Problems Involving Geometric Figures

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

31A: Use Block, Wiring, and Schematic Diagrams

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form

33A: Record Essential Information

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: CLERK-TYPIST
Occupation Code: C02

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01G: Rounding Numbers
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges

06A: Identify Directions that Tools, Hardware, or Components May be Moved

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

16B: Compute Averages
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences
33D: Record Information in More Advanced Situations

34C: Select Appropriate Details for Main Ideas

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: COMPUTER OPERATOR
Occupational Code: C03

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series

02A: Interpret the Markings on Linear Scales
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment

07B: Identify Parallel, Intersecting, and Other Lines
07E: Draw Lines

08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

15A: Draw Plane Geometric Figures
15B: Match Geometric Figures with Their Word Names

16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language
26F: Recognize Radio and Navigation Terms

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables
28D: Use Troubleshooting Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure

30A: Identify the Meaning of Symbols on a Flow Chart
30B: Use Flow Charts to Make Decisions
30C: Use an Organization Chart to Identify Members of an Organization

31A: Use Block, Wiring, and Schematic Diagrams
31B: Identify Component Symbols

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences
33D: Record Information in More Advanced Situations

34A: Identify Major and Subordinate Topics
34B: Write Titles Using Main Ideas
34C: Select Appropriate Details for Main Ideas
34D: Label the Parts of an Outline

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: CORRECTIONS OFFICER
Occupation Code: C04

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02D: Identify Measures of Weight, Pressure, and Torque
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Marking
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations

08E: Identify Objects Based on Position

09A: Identify Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14D: Convert Decimals, Percents, and Fractions

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26F: Recognize Radio and Navigation Terms

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28D: Use Troubleshooting Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure

30A: Identify the Meaning of Symbols on a Flow Chart

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36C: Identify Words that Need to be Capitalized
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action

Occupational Title: COSMETOLOGIST
Occupation Code: C05

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02E: Identify Measures of Volume and Capacity

04A: Interpret 24 Hour Time

06A: Identify Directions that Tools, Hardware, or Components May be Moved

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12G: Add and Subtract Measurements

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

16B: Compute Averages

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action

29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action

Occupational Title: ELECTRICIAN
Occupation Code: E01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05E: Read and Interpret Multi-Scale Gauges
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07E: Draw Lines

09A: Identify Angles
09B: Identify Types of Angles

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15F: Compute Area and Perimeter of a Rectangle
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids
15I: Use Formulas to Solve Problems Involving Geometric Figures
15J: Read Voltage, Voltage Difference, and Time Duration from an Oscilloscope

16A: Estimate the Center of an Object
16B: Compute Averages
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

31A: Use Block, Wiring, and Schematic Diagrams
31B: Identify Component Symbols
31C: Trace Circuit Paths on a Schematic Diagram
31D: Use a Troubleshooting Table and Schematic Diagrams
31E: Identify and Locate Parts of Schematic Diagrams

32A: Find Parts on a Form
32B: Fill in Numbers on a Form

34D: Label the Parts of an Outline

35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: ELECTRICAL ASSEMBLY TECHNICIAN
Occupation Code: E02

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02G: Estimate Lengths and Distances

03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05E: Read and Interpret Multi-Scale Gauges
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers

14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15E: Construct Perpendicular Lines Using a Protractor
15F: Compute Area and Perimeter of a Rectangle
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids
15I: Use Formulas to Solve Problems Involving Geometric Figures
15J: Read Voltage, Voltage Difference, and Time Duration from an Oscilloscope

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

17A: Read and Write Grid Coordinates on the Military Map

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language
26F: Recognize Radio and Navigation Terms

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information

27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables
28D: Use Troubleshooting Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

30A: Identify the Meaning of Symbols on a Flow Chart
30B: Use Flow Charts to Make Decisions
30C: Use an Organization Chart to Identify Members of an Organization

31A: Use Block, Wiring, and Schematic Diagrams
31B: Identify Component Symbols
31C: Trace Circuit Paths on a Schematic Diagram
31D: Use a Troubleshooting Table and Schematic Diagrams
31E: Identify and Locate Parts of Schematic Diagrams

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35G: Report Writing - Summarize Events
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: FIREFIGHTER
Occupation Code: F01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects

09A: Identify Angles
09B: Identify Types of Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables
28D: Use Troubleshooting Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29C: Read and Use Sections Illustrations
29D: Use 3-D or Exploded Views to Complete an Action
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

30C: Use an Organization Chart to Identify Members of an Organization

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
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35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: FLORAL DESIGNER
Occupation Code: F02

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01G: Rounding Numbers

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

16B: Compute Averages

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows

29A: Read Illustrations
29D: Use 3-D or Exploded Views to Complete an Action

32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes

34A: Identify Major and Subordinate Topics

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar

41C: Identify Defects or Damage to Equipment
41G: Use Your Senses to Determine a Course of Action

Occupational Title: HOME HEALTH AIDE
Occupation Code: H01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02E: Identify Measures of Volume and Capacity

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge

06C: Interpret Spatial Relations

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15A: Draw Plane Geometric Figures
15B: Match Geometric Figures with Their Word Names
15C: Identify Parts of Geometric Figures

16B: Compute Averages

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows
28C: Find Information in Complex Tables

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29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

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30B: Use Flow Charts to Make Decisions
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32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences
33D: Record Information in More Advanced Situations

34A: Identify Major and Subordinate Topics
34B: Write Titles Using Main Ideas
34C: Select Appropriate Details for Main Ideas
34D: Label the Parts of an Outline

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized

36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: LICENSED PRACTICAL NURSE
Occupation Code: L01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02D: Identify Measures of Weight, Pressure, and Torque
02E: Identify Measures of Volume and Capacity
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05E: Read and Interpret Multi-Scale Gauges
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15G: Compute the Area and Circumference of a Circle
15I: Use Formulas to Solve Problems Involving Geometric Figures

16B: Compute Averages
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26F: Recognize Radio and Navigation Terms

27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
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28C: Find Information in Complex Tables
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35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35G: Report Writing - Summarize Events
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: MACHINIST
Occupation Code: M01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01E: Identify an Object with a Specified Ordinal Position
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02D: Identify Measures of Weight, Pressure, and Torque
02E: Identify Measures of Volume and Capacity
02F: Measure with a Non-Numerical Calibrated Scale
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature
03B: Estimate the Measure of an Angle not Greater than 180 Degrees

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings
05E: Read and Interpret Multi-Scale Gauges
05F: Match a Gauge Reading to a Specification
05G: Read and Interpret Unnumbered Gauges
05H: Read a Moving Gauge
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

09A: Identify Angles
09B: Identify Types of Angles
09C: Identify Types of Triangles
09D: Draw Bisectors of Angles and Altitudes of Triangles
09E: Label Angles

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
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13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers
13E: Estimate a Product or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15A: Draw Plane Geometric Figures
15B: Match Geometric Figures with Their Word Names
15C: Identify Parts of Geometric Figures
15F: Compute Area and Perimeter of a Rectangle
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids
15I: Use Formulas to Solve Problems Involving Geometric Figures
15J: Read Voltage, Voltage Difference, and Time Duration from an Oscilloscope

16B: Compute Averages
16C: Solve Problems Combining All Processes, Using Whole Numbers, Mixed Numbers, and Fractions
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
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32C: Fill in Information on a Form
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32E: Locate and Compare Facts on a Form

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33B: Record Mental and Written Notes
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36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings

36E: Apply Punctuation Rules
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: NURSE'S AIDE
Occupational Code: N01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01F: Write or State the Place Value of a Particular Digit in a Whole or Decimal Number
01G: Rounding Numbers
01I: Match Positive and Negative Numbers or Points with Tick Marks on a Number Line

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02E: Identify Measures of Volume and Capacity

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05D: Read and Interpret Scales with Positive and Negative Markings

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

08C: Use Descriptions to Identify Objects
08E: Identify Objects Based on Position

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers

14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

16B: Compute Averages
16D: Solve Problems Using Units of Measurement
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows

29A: Read Illustrations

30A: Identify the Meaning of Symbols on a Flow Chart
30B: Use Flow Charts to Make Decisions

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: PLUMBER
Occupation Code: P01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02D: Identify Measures of Weight, Pressure, and Torque
02E: Identify Measures of Volume and Capacity
02G: Estimate Lengths and Distances

03A: Identify Degrees and Mils as Units in Determining Angular Measurement or Temperature

04A: Interpret 24 Hour Time
04C: Estimate Time in Seconds and Minutes

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge
05F: Match a Gauge Reading to a Specification
05I: Adjust Gauges to Meet Specifications

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06B: Align Parts and Equipment
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

07A: Identify Points, Lines, Line Segments, and Rays
07B: Identify Parallel, Intersecting, and Other Lines
07C: Identify Perpendicular and Intersecting Lines
07D: Superimpose Lines
07E: Draw Lines

08A: Identify Geometric Shapes
08B: Identify Characteristics of Plane Shapes
08C: Use Descriptions to Identify Objects
08D: Match Figures of Both Actual Size and Model Drawings
08E: Identify Objects Based on Position

10A: Recognize Solid Shapes and Match Solid Figure Shapes to Their Names

11A: Identify Shape and Position Terms
11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12F: Increase and Decrease Values on Measuring Instruments
12G: Add and Subtract Measurements
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers

13C: Divide Numbers with Decimals
13E: Estimate a Produce or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15C: Identify Parts of Geometric Figures
15G: Compute the Area and Circumference of a Circle
15H: Compute the Area and Volume of Rectangular Solids

16B: Compute Averages
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion
16H: Use Word Problems

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference

28A: Find Information in Two-Column Tables
28B: Find Information in Tables with Columns and Rows

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

30A: Identify the Meaning of Symbols on a Flow Chart
30C: Use an Organization Chart to Identify Members of an Organization

31A: Use Block, Wiring, and Schematic Diagrams

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form

33A: Record Essential Information

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Occupational Title: POLICE OFFICER
Occupation Code: P02

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01G: Rounding Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02G: Estimate Lengths and Distances

04A: Interpret 24 Hour Time
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

05A: Read and Interpret Gauges
05B: Use Gauges with Digital Readouts
05C: Read a Color Band Gauge

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06C: Interpret Spatial Relations

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

15A: Draw Plane Geometric Figures

16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems

18A: Solve Simple Algebraic Equations
18B: Derive Equivalent Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas

25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: FindInformation in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29F: Integrate Visual Information to Select a Course of Action

30C: Use an Organization Chart to Identify Members of an Organization

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences
33D: Record Information in More Advanced Situations

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35G: Report Writing - Summarize Events
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action

Occupational Title: RECORD KEEPER
Occupation Code: R01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01C: Order Numbers in a Specific Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers
01G: Rounding Numbers
01H: Count Forward or Backward by a Given Number and Determine the Next Number in a Series

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks
02F: Measure with a Non-Numerical Calibrated Scale

04A: Interpret 24 Hour Time
04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes
04E: Express Time Using Decimals

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12H: Estimate a Sum or Difference

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13E: Estimate a Produce or Quotient

14A: Estimate Fractional Length, Area, Volume, and Distance
14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions
14G: Estimate Fractional Parts Using Common Fractions

16B: Compute Averages

18A: Solve Simple Algebraic Equations

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: FindInformation in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29F: Integrate Visual Information to Select a Course of Action

30B: Use Flow Charts to Make Decisions

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes

35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar

41A: Identify Similarities and Differences Between and Among Objects
41G: Use Your Senses to Determine a Course of Actions Taken

Occupational Title: WORD PROCESSOR
Occupation Code: W01

01A: Match Numbers with Word Names and Models
01B: Write Numbers in Sequence
01D: Identify the Greatest or Least Number from a Set of Numbers

02A: Interpret the Markings on Linear Scales
02B: Identify Units of Measure and Classify According to Type of Measure
02C: Measure Lengths and Distances Using Rules, Yardsticks, or Metersticks

04B: Use the Position of the Clock to Indicate Direction
04C: Estimate Time in Seconds and Minutes

06A: Identify Directions that Tools, Hardware, or Components May be Moved
06C: Interpret Spatial Relations
06D: Relate Symbols to What They Represent

11B: Identify Spatial Orientation Terms with Positions

12A: Add and Subtract Whole Numbers without Carrying or Borrowing
12B: Add and Subtract Whole Numbers with Carrying or Borrowing
12C: Add and Subtract Decimals
12D: Add and Subtract Positive and Negative Numbers

13A: Multiply and Divide Whole Numbers
13B: Multiply and Divide Decimal Numbers
13C: Divide Numbers with Decimals
13D: Multiply and Divide Negative and Positive Numbers

14B: Reduce Fractions to Lowest Terms
14C: Use a Conversion Table to Convert Decimals and Fractions
14D: Convert Decimals, Percents, and Fractions
14E: Add and Subtract Fractions
14F: Multiply and Divide Fractions

16B: Compute Averages
16E: Get Information from Number Lines, Graphs, Tables, and Scales
16F: Solve Conversion Problems
16G: Solve Problems Involving Ratio and Proportion

18A: Solve Simple Algebraic Equations
18C: Calculate with a Pocket Calculator

25A: Follow Directions to Complete a Task Activity
25B: Select Text and Visual Materials
25C: Follow Directions
25D: Find Main Ideas
25E: Situational Decision Making
25F: Procedural Directions

26A: Recognize Meanings of Common Task-Related Words
26C: Identify the Meaning of a Word from Context
26D: Identify Meanings of Contractions, Abbreviations, and Acronyms
26E: Determine the Meaning of Figurative Language

27B: Locate and File Information Alphabetically
27C: Locate Information from a Table of Contents, Index, Appendix, and Glossary
27D: Find the Title Page, Paragraph, Figure, or Chart to Answer Questions and Solve Problems
27E: Skim or Scan for Relevant Information
27F: Locate Information to Perform a Task Using Cross Reference
27G: Organize Information from Multiple Sources

28A: Find Information in Two-Column Tables
28B: FindInformation in Tables with Columns and Rows
28C: Find Information in Complex Tables

29A: Read Illustrations
29B: Use a Key, Legend, or Parts List
29E: Use a Sequence of Illustrations to Follow a Procedure
29F: Integrate Visual Information to Select a Course of Action

30A: Identify the Meaning of Symbols on a Flow Chart

32A: Find Parts on a Form
32B: Fill in Numbers on a Form
32C: Fill in Information on a Form
32D: Write Descriptive Information on a Form
32E: Locate and Compare Facts on a Form

33A: Record Essential Information
33B: Record Mental and Written Notes
33C: Record Information Using Sentences

35A: Report Writing - Assemble Information
35B: Report Writing - Summarize Details for a Report
35C: Report Writing - Select Relevant Details for a Written Report
35D: Report Writing - Sequence Events in Logical Order
35E: Report Writing - State Facts and General Impressions
35H: Report Writing - Summarize the Major Points
35I: Report Writing - Write a Report that Justifies Actions Taken

36A: Spell Frequently Used Words Correctly
36C: Identify Words that Need to be Capitalized
36D: Use a Reference Source to Correct Misspellings
36E: Apply Punctuation Rules
36F: Apply Common Rules of Grammar
36G: Rewriting Paragraphs
36H: Appraise a Written Communication and Make Adjustments to Improve Clarity

41A: Identify Similarities and Differences Between and Among Objects
41C: Identify Defects or Damage to Equipment
41D: Move, Align, and Connect Objects
41E: Identify Objects by Their Characteristics
41G: Use Your Senses to Determine a Course of Action
41H: Use Codes to Perform a Task

Appendix B: Civilian Job Equivalents and Military Job Prescriptions

Appendix B contains a table for equating civilian occupations to Military Occupational Specialties (MOS). Included on the table are DOT (Dictionary of Occupational Titles) codes, civilian job titles, MOS codes, and military job titles. The JSEP prescriptions for the 94 MOS follow the table.

CIVILIAN EQUIVALENTS TO MILITARY OCCUPATIONS

DOT CODE	CIVILIAN JOB TITLE	MOS	MILITARY JOB TITLE
193262034	Radiotelephone Operator	05B	Radio Operator
203582050	Telegraphic-Typewriter Operator	05C	Radio Telephone Operator
193362014	Radio-Intelligence Operator	05G	Signal Security Spec.
869687026	Construction Worker 2	12B	Combat Engineer
454684018	Logger, All-Round		
859261010	Blaster		
869683014	Rigger (Construction)		
921260010	Rigger (Any Ind.)		
828281010	Electronic Mechanic (Any Ind.)	24C	Improved Hawk Firing Sec.
828281010	Electronic Mechanic (Any Ind.)	24H	Improved Hawk Fire Control
823281914	Electronic Radio (Any Ind.)	26L	Tac. Microwave Sys. Rep.
193262034	Radiotelephone Operator (Any Ind.)	26Q	Tac. Satellite/Microwave
828281010	Electronic Mechanic	27E	Tow/Dragon Repairer
822281010	Automatic-Equip. Technician	31J	Teletypewriter Repairer
193262034	Radiotelephone Oper. (Any Ind.)	31M	Multichannel Comm. Equip.
235462010	Central-Office Operator (Tel. & Tl.)	31N	Tac. Circuit Controller
822381018	Private-Branch Exchange Install.		
193262934	Radiotelephone Operator	31V	Tac. Comm. Systems Op.
823261018	Radio Mechanic (Any Ind.)	32D	Station Technical Control
823281014	Electrician, Radio (Any Ind.)		
823281010	Avionics Technician		
823281014	Electronic, Radio	32H	Fixed Station Radio Repair
828281010	Electronic Mechanic	33S	EW/Intercept. Systems Rep.
823281010	Avionics Technician	35K	Avionic Mechanic
823261018	Radio Mechanic		
828281010	Electronic Mechanic		
822381014	Line Installer Repairer (Tel. & Tl.)	36C	Wire System Installer
822381018	Private-Branch-Exch. Install.		
235662022	Telephone Operator (Clerical)	36K	Tac. Wire Operations Spec.
912684010	Parachute Rigger (Air Trans.)	43E	Parachute Rigger
789684034	Parachute Folder (Tex. Prod.)		
789684038	Parachute Mender (Tex. Prod.)		
789687114	Parachute Inspector (Tex. Prod.)		
637261014	Envir.-Control-System-Installer	52C	Utilities Equip. Repairer
637261026	Refrigeration Mechanic		
869281010	Furnace Installer/Repairer, Hot		
625281026	Gas-Engine Repairer	52D	Power Generation Equip.
631261014	Powerhouse Mechanic (Light, Ht.)		
820261014	Electrician, Powerhouse (Light, Ht.)		
199384010	Decontaminator	54E	NBC Specialist
222367038	Magazine Keeper (Clerical)	55B	Ammunition Spec.
632261018	Ordinance Artificer (Govt. Ser.)	55D	Explosive Ordinance Disp.
361665010	Washer, Machine	57E	Laundry & Bath Spec.
361685018	Laundry Worker II		
362382014	Dry Cleaner		
369684014	Laundry Operator		
922687090	Stevedore II (Water Trans.)	57H	Cargo Spec.

CIVILIAN EQUIVALENTS TO MILITARY OCCUPATIONS

DOT CODE	CIVILIAN JOB TITLE	MOS	MILITARY JOB TITLE
911663014	Stevedore I (Water Trans.)		
929687030	Material Handler (Any Ind.)		
222367010	Cargo Checker (Water Trans.)		
911364010	Able Seaman	61B	Watercraft Operator
911663010	Motorboat Operator		
911687022	Deckhand		
911687030	Ordinary Seaman		
623281026	Machinist, Marine Engine	61C	Watercraft Engineer
623281038	Motorboat Mechanic		
623281034	Maintenance Mechanic Engine		
620261022	Construction Equip. Mechanic	62B	Construction Equip. Rep.
620281058	Tractor Mechanic (Auto. Ser.)		
625281010	Diesel Mechanic		
850683010	Bulldozer Operator I	62E	Heavy Construction Equip.
850683038	Scraper Operator (Const.)		
620261010	Automobile Mechanic (Auto. Ser.)	63G	Fuel & Electrical Systems
620381014	Mechanic, Endless Track Vehicle	63H	Track Vehicle Repairer
625281010	Diesel Mechanic		
620381014	Mechanic, Endless Track Vehicle	63N	M60A1/A3 Tank System
620261010	Automobile Mechanic		
620261010	Automobile Mechanic	63W	Wheel Vehicle Repairer
620281050	Mechanic, Indust., Truck		
620281058	Tractor Mechanic		
625281010	Diesel Mechanic		
904383010	Tractor-Trailer-Truck Driver	64C	Motor Transport Operator
903683018	Tank-Truck Driver		
905663014	Truck Driver, Heavy		
906683022	Truck Driver, Light		
621281014	Airframe-And-Power-Plant	67G	Utility/Cargo Airplane Rep.
621281014	Airframe-And-Power-Plant	67N	Utility Helicopter
621281014	Airframe-And-Power-Plant	67T	Tactical Transport Helic.
621281014	Airframe-And-Power-Plant	67U	Medium Helicopter Repair
621281014	Airframe-And-Power-Plant	67V	Observation/Scout Helicopter
621281014	Airframe-And-Power-Plant	67Y	Attack Helicopter Repairer
621281014	Airframe-And-Power-Plant	68B	Aircraft Power Plant Repair
621281014	Airframe-And-Power-Plant	68D	Aircraft Power Train Rep.
825281018	Electrician, Airplane	68F	Aircraft Electrician
807261010	Aircraft Body Repairer	68G	Aircraft Structural Repair
806381054	Skin Fitter (Aircraft-Aerospace)		
621281014	Airframe-And-Power-Plant	68H	Aircraft Pneudraulics
621381022	Pneumatic Tester & Mechanic		
828281010	Electronics Mechanic (Any Ind.)	68J	Aircraft Fire Control Rep.
632261010	Aircraft-Armament Mechanic	68M	Aircraft Weapon Systems
632261018	Ordinance Artificer (Govt. Ser.)		
119267026	Paralegal Assistant	71D	Legal Specialist
201362010	Legal Secretary		
219362910	Administrative Clerk	71L	Administrative Spec
203362022	Post-Office Clerk		
243367014	Post-Office Clerk (Govt. Ser.)		

CIVILIAN EQUIVALENTS TO MILITARY OCCUPATIONS

DOT CODE	CIVILIAN JOB TITLE	MOS	MILITARY JOB TITLE
203362010	Clerk-Typist		
209562010	Clerk, General		
29107018	Director of Religious Activities	71M	Chapel Activities Spec.
*248387010	Flight Operations Specialist	71P	Flight Operations Coor.
131267014	Newswriter (Print & Pub.)	71Q	Journalist
131267018	Reporter		
132267014	Editorial Assistant (Print & Pub.)		
143062034	Photojournalist (Print & Pub.)		
203582018	Cryptographic-Machine Oper.	72E	Combat Telecom. Center
203582050	Telegraphic-Typewriter Oper.		
213362010	Computer Operator (Clerical)	74D	Computer/Machine Oper.
020162014	Programmer, Business	74F	Programmer/Analyst
219367026	Programmer, Detail (Clerical)		
209562010	Personnel Clerk	75B	Personnel Admin. Spec.
209562010	Clerk, General		
203362010	Clerk-Typist		
222367042	Parts Clerk	76C	Equip. Records & Parts Sp.
*221367038	Maintenance Data Analyst		
222387058	Stock Clerk	76Y	Unit Supply Specialist
222387050	Shipping & Receiving Clerk		
018167034	Surveyor Assistant Instruments	82C	Field Artillery Surveyor
018167014	Geodetic Computer		
079374010	Emergency Medical Tech.	91A	Medical Specialist
078362022	Electroencepholographic Tech.		
193162018	Air-Traffic-Control Spec. Tower	93J	ATC Radar Controller
313361014	Cook	94B	Food Service Specialist
313381010	Baker		
313381030	Cook, School Cafeteria		
316681010	Butcher, Meat		
375263014	Police Officer I	95B	Military Police
372667034	Guard Security		
375263018	State-Highway Police Officer		
377263010	Sheriff, Deputy		
372667018	Correction Officer	95C	Correctional Specialist
166267022	Prisoner-Classification-Interview		

MOS 05b: Radio Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14B 14D 14E 14F
15A 15B 15C 15E 15F 15G 15H 15I 15J
16B 16G
17A 17B
19B 19C 19D
25A 25B 25C 25D
26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
31A 31B 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35C 35D 35E 35F 35H 35I
36C 36D 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 05c: Radio Teletype Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 05b: Radio Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16A 16B 16G
17A 17B
19B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C
34A 34B 34C 34D
35A 35B 35C 35D 35E 35F 35H 35I 35J
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 11b: Infantry man

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 2H
13A 13B 13C
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C
16A 16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B . 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 11c: Indirect Fire Infantryman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09B 09C 09D 09E
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C 15F
16B 16C 16E 16F 16G
17A 17B 17C
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 11h: Heavy Antiarmor Weapons Crewman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C
16A 16B 16C 16D 16E 16F 16G 16H
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B 33C 33D
34A 34C 34D
35A 35B 35C 35D 35E 35F 35H 35I
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 11m: F V Infantryman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C
16B 16E 16G
17A 17B
25A 25B 25C 25D
26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34A 34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 12b: Combat Engineer

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02D	02E	02F	02G		
03A	03B							
04A	04B	04C						
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07E					
08A	08B	08C	08D	08E				
09A	09D	09E						
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12G	12H	
13A	13B	13C						
14A	14B	14D	14E	14F				
15A	15B	15C	15F	15G	15H	15I		
16B	16C	16D	16F	16G	16H			
17A	17B							
18C								
25A	25B	25C	25D					
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F				
28A	28B	28D						
29A	29B	29C	29D	29E				
30A								
32A	32B	32C	32D	32E				
33A	33B							
34D								
35B	35D	35E	35F	35H				
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 13b: Cannon Crewman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C 15G
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 13e: Cannon Fire Direction Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14C 14D 14E 14F
15A 15B 15C 15E
16A 16B 16C 16D 16E 16F 16G 16H
17A 17B 17C 17D
18A
19B
25A 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36C
40C
41A 41C 41D 41E 41F 41G 41H

MOS 13f: Fire Support Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16B 16G
17C 17D
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 15d: Lance Crew Member

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16B 16F 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 15e: Pershing Missile Crew Member

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C
16A 16B 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41D 41E 41F 41G 41H

MOS 16d: Hawk Missile Crew Member

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C 15J
16B 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
40C
41A 41C 41D 41E 41F 41G 41H

MOS 16e: Hawk Fire Control Crew Member

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13E
14A 14B 14D 14F
15A 15B 15C 15J
16B 16G
17A 17B
25A 25B 25C 25D
26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 16h: ADA Operations & Intelligence Assistant

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02E	02F	02G			
03A	03B							
04A	04B	04C						
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07E					
08A	08C	08D	08E					
09A	09D							
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12G	12H	
13A	13B	13C	13D					
14A	14B	14D	14E	14F				
15A	15B	15C						
16B	16E	16G						
17A	17B							
18A								
25A	25B	25C	25D	25E				
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F	27G			
28A	28B	28D						
29A	29B	29C	29D	29E				
30A	30B							
31A	31B							
32A	32B	32C	32D	32E				
33A	33B							
34A	34D							
35A	35B	35D	35E	35F	35H	35J		
36A								
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 16p: Short Range ADA Missile Crewman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F
15A 15B 15C
16B 16C 16D 16G 16H
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 17b: Field Artillery Radar Crew Member

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C 15J
16B 16C 16D 16E 16G 16H
17A 17B 17C 17D
18A 18B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 17c: Field Artillery Target Acquisition Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D 13E
14A 14B 14C 14D 14E 14F
15A 15B 15C 15E 15J
16B 16C 16E 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27G
28A 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 17k: Ground Surveillance Radar Crewman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F
15A 15B 15C 15J
16B 16C 16D 16E 16G 16H
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I 35J
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 19d: Cavalry Scout

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35A 35B 35D 35E 35F 35H 35I
36A 36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 19e: Armor Crewman

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13E
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36D
40C
41A 41C 41D 41E 41F 41G 41H

MOS 24c: Improved Hawk Firing Section Mechanic

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09B 09D 09E
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14C 14D 14F 14G
15A 15B 15J
16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B 30C
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 24h: Improved Hawk Fire Control Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09B 09C 09D 09E
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C 15E 15F 15G 15H 15I 15J
16A 16B 16C 16D 16E 16F 16G 16H
17A 17B 17C 17D
18A 18B 18C
19B 19C 19D
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B 30C
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B 33C 33D
34A 34B 34C 34D
35A 35B 35D 35E 35F 35G 35H 35I 35J
36A 36C 36D 36E 36F 36G 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 26l: Tactical Microwave Systems Repairer

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02E	02F	02G			
03A	03B							
04A	04B	04C						
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07E					
08A	08B	08C	08D	08E				
09A	09D							
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12G	12H	
13A	13B	13C	13D					
14A	14B	14D	14F					
15A	15B	15C	15F	15J				
16B	16G							
17A	17B							
25A	25B	25C	25D					
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F				
28A	28B	28C	28D					
29A	29B	29C	29D	29E	29F			
30A								
32A	32B	32C	32D	32E				
33A	33B							
34D								
35A	35B	35D	35E	35F	35H	35I		
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 26q: Tactical Satellite/Microwave Systems Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15J
16A 16B 16G
17A 17B
18A
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 27e: Tow Dragon Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C
16B 16E 16G
17A 17B
18A
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B
34B 34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 31j: Teletype Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C
25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 31m: Multichannel Communications Equipment Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C
16B 16G
17A 17B
18A
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 31n: Tactical Circuit Controller

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14C 14D 14E 14F
15A 15B 15C
16B 16C 16D 16E 16F 16G 16H
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 31v: Tactical Communications Equipment Operator/Mechanic

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
19B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 32d: Station Technical Controller

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B
34A 34D
35A 35B 35D 35E 35F 35G 35H 35I 35J
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 32h: Fixed Station Radio Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15F 15G 15H 15I 15J
16B 16G
17A 17B
18A 18B 18C
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H 35I 35J
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 33s: Electronic Warfare/Intercept Systems Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F
15A 15B 15C 15F 15G 15H 15I 15J
16B 16C 16D 16F 16G 16H
17A 17B 17C 17D
18A
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35G 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 35k: Avionic Mechanic

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F
15A 15B 15C
16B 16C 16D 16G 16H
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B
34D
35B 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 36c: Wire Systems Installer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14F
15A 15B 15C
16B 16F 16G 16H
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
31A 31B
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35J
36A 36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 36k: Tactical Wire Operations Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 43e: Parachute Rigger

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 43m: Fabric Repair Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D 13E
14A 14B 14C 14D 14F
15A 15B 15C 15E 15F 15J
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
40C
41A 41C 41D 41E 41F 41G 41H

MOS 44b: Metalworker

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16A 16B 16F 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 44e: Machinist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16B 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36C 36D 36E 36F 36G 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 45b: Small Arms Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B
31A 31B 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 45k: Tank Turret Repairer

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02D	02E	02F	02G		
03A	03B							
04A	04B	04C						
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07E					
08A	08C	08D	08E					
09A	09D							
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12H		
13A	13B	13C						
14A	14B	14C	14D	14E	14F			
15A	15B	15C						
16B	16G							
17A	17B							
25A	25B	25C	25D	25E	25F			
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F	27G			
28A	28B	28D						
29A	29B	29C	29D	29E				
30A	30B							
31A	31B	31C	31D	31E				
32A	32B	32C	32D	32E				
33A	33B							
34D								
35B	35D	35E	35F	35H				
36A								
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 52c: Utilities Equipment Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C 15E
16B 16C 16E 16F 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 52d: Power Generation Equipment Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14C 14D 14F
15A 15B 15C
16B 16F 16G 16H
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 54e: NBC Specialist

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02D	02E	02F	02G		
03A	03B							
04A	04B	04C	04E					
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07D	07E				
08A	08B	08C	08D	08E				
09A	09B	09C	09D					
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12H		
13A	13B	13C						
14A	14B	14C	14D	14E	14F	14G		
15A	15B	15C	15E	15F	15G	15H	15I	
16B	16G							
17A	17B							
25A	25B	25C	25D	25E	25F			
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F	27G			
28A	28B	28C	28D					
29A	29B	29C	29D	29E	29F			
30A								
32A	32B	32C	32D	32E				
33A	33B	33C						
34A	34B	34C	34D					
35A	35B	35D	35E	35F	35H	35I		
36A	36C	36E	36F	36H				
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 55b: Ammunition Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15J
16B 16C 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I 35J
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 55d: Explosive Ordinance Disposal Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09B 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C 15E 15F 15G
16B 16C 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B 33C
34D
35B 35D 35E 35F 35H
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 57e: Laundry and Bath Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C 15F 15J
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 57h: Cargo Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C 15J
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 61b: Watercraft Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F
15A 15B 15C
16B 16F 16G
17A 17B
18A 18B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 61c: Watercraft Engineer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14C 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31D 31E
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35B 35D 35E 35F 35H
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 62b: Construction Equipment Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13E
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H 35I
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 62e: Heavy Construction Equipment Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I

02A 02B 02C 02E 02F 02G

03A 03B

04A 04B 04C 04E

05A 05B 05C 05D 05E 05F 05G 05H 05I

06A 06B 06C 06D

07A 07B 07C 07E

08A 08C 08D 08E

09A 09D

10A

11A 11B

12A 12B 12C 12D 12E 12F 12G 12H

13A 13B 13C

14A 14B 14D 14E 14F 14G

15A 15B 15C

16B 16C 16D 16E 16G 16H

17A 17B

25A 25B 25C 25D 25E

26A 26C 26D 26E 26F

27B 27C 27D 27E 27F 27G

28A 28B 28D

29A 29B 29C 29D 29E 29F

30A

32A 32B 32C 32D 32E

33A 33B

34D

35A 35B 35D 35E 35F 35H

40C

41A 41C 41D 41E 41F 41G 41H

MOS 63g: Fuel and Electrical Systems Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16F 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B 30C
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 63h: Track Vehicle Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16B 16F 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H 35J
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 63n: M60 A1/A3 Tank System Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14C 14D 14F
15A 15B 15C
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 63w: Wheel Vehicle Repairer

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02C	02D	02E	02F	02G			
03A	03B							
04A	04B	04C						
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07E					
08A	08B	08C	08D	08E				
09A	09D							
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12G	12H	
13A	13B	13C	13D					
14A	14B	14D	14E	14F				
15A	15B	15C	15F	15J				
16B	16C	16F	16G					
17A	17B							
25A	25B	25C	25D	25E				
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F	27G			
28A	28B	28C	28D					
29A	29B	29C	29D	29E	29F			
30A								
31A	31B	31E						
32A	32B	32C	32D	32E				
33A	33B							
34D								
35B	35D	35E	35F	35H				
36A								
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 64c: Motor Transport Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H 35J
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67g: Utility/Cargo Airplane Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F 14G
15A 15B 15C 15G
16A 16B 16G
17A 17B
18A
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35J
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67n: Utility Helicopter Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B
32A 32B 32C 32D 32E
33A 33B
34A 34B 34C 34D
35B 35D 35E 35F 35G 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67t: Tactical Transport Helicopter Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F
15A 15B 15C
16B 16C 16D 16G 16H
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67u: Medium Transport Helicopter Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14F
15A 15B 15C 15F 15J
16B 16F 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27F
28A 28B 28C 28D
29A 29B
30A 30B 30C
31A 31B 31E
32A 32B 32D 32E
33A
34D
35B 35D 35E 35F 35H
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67v: Observation/Scout Helicopter Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16F 16G 16H
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35B 35D 35E 35F 35H
36A 36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 67y: Attack Helicopter Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68b: Aircraft Power Plant Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C 15G
16B 16C 16F 16G 16H
17A 17B
18A
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35A 35B 35D 35E 35H 35J
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68d: Aircraft Power Train Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14E 14F 14G
15A 15B 15C 15F 15G
16A 16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B 30C
31A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68f: Aircraft Electrician

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14C 14D 14E 14F
15A 15B 15C
16B 16E 16G
17A 17B
18A
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68g: Aircraft Structural Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C 15F 15J
16B 16F 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68h: Aircraft Pneudraulic Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D 09E
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14C 14D 14F
15A 15B 15C 15J
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35B 35D 35E 35F 35H
36A 36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 68j: Aircraft Fire Control Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I

02A 02B 02C 02D 02E 02F 02G

03A 03B

04A 04B 04C 04E

05A 05B 05C 05D 05E 05F 05G 05H 05I

06A 06B 06C 06D

07A 07B 07C 07E

08A 08C 08D 08E

09A 09D

10A

11A 11B

12A 12B 12C 12D 12E 12F 12H

13A 13B 13C

14A 14B 14D 14E 14F 14G

15A 15B 15C

16B 16G

17A 17B

25A 25B 25C 25D 25F

26A 26C 26D 26E 26F

27B 27C 27D 27E 27F

28A 28B 28C 28D

29A 29B 29C 29D 29E 29F

30A

31A 31B 31C 31E

32A 32B 32C 32D 32E

33A 33B 33C

34D

35B 35D 35E 35F 35H

36A 36E 36F

40C

41A 41C 41D 41E 41F 41G 41H

MOS 68m: Helicopter Weapon System Repairer

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14C 14D 14E 14F 14G
15A 15B 15C 15F 15G 15H 15I 15J
16B 16C 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A 30B
31A 31B 31C 31D 31E
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 71d: Legal Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35G 35H 35I
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 711: Administration Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14F
15A 15B 15C 15F
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 71m: Chapel Activities Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C
34D
35B 35D 35E 35F 35H
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 71p: Flight Operations Coordinator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16E 16G
17A 17B
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C
34D
35A 35B 35D 35E 35F 35H 35I 35J
36A 36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 71q: Journalist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14F
15A 15B 15C
16B 16F 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 72e: Combat Telecommunications Center Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13E
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A 30B
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B 33C
34A 34B 34C 34D
35A 35D 35H 35I
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 74d: Computer/Machine Operator

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 74f: Programmer/Analyst

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C
16B 16C 16G
17A 17B
18A 18B 18C
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B 30C
31A 31B
32A 32B 32C 32D 32E
33A 33B 33C 33D
34A 34B 34C 34D
35A 35B 35D 35E 35F 35H 35I 35J
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 75b: Personnel Administrative Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I
36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76c: Equipment Records and Parts Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76p: Materials Control and Accounting Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A 30B
31A 31B
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76v: Materials Storage and Handling Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B 33C
34D
35B 35D 35E 35F 35H
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76w: Petroleum Supply Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C 15H
16B 16F 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
31A 31B
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76x: Subsistence Supply Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C
16B 16G
17A 17B
18A
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 76y: Unit Supply Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C 15H
16B 16G
17A 17B
25A 25B 25C 25D
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B 31C
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
36A 36D
40C
41A 41C 41D 41E 41F 41G 41H

MOS 82c: Field Artillery Surveyor

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07D 07E
08A 08B 08C 08D 08E
09A 09B 09C 09D 09E
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D 13E
14A 14B 14D 14E 14F
15A 15B 15C 15F 15G 15H 15I 15J
16B 16C 16D 16E 16G 16H
17A 17B 17C 17D
18A 18C
19B 19C 19D
25A 25B 25C 25D 25E
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E
30A
31A 31B 31E
32A 32B 32C 32D 32E
33A 33B 33C 33D
34D
35A 35B 35D 35E 35F 35H 35I 35J
36E 36F
40C
41A 41C 41D 41E 41F 41G 41H

MOS 91a: Medical Specialist

01A	01B	01C	01D	01E	01F	01G	01H	01I
02A	02B	02C	02D	02E	02F	02G		
03A	03B							
04A	04B	04C	04E					
05A	05B	05C	05D	05E	05F	05G	05H	05I
06A	06B	06C	06D					
07A	07B	07C	07D	07E				
08A	08B	08C	08D	08E				
09A	09D							
10A								
11A	11B							
12A	12B	12C	12D	12E	12F	12G	12H	
13A	13B	13C						
14A	14B	14C	14D	14E	14F	14G		
15A	15B	15C						
16B	16C	16D	16F	16G	16H			
17A	17B							
25A	25B	25C	25D	25E	25F			
26A	26C	26D	26E	26F				
27B	27C	27D	27E	27F				
28A	28B		28D					
29A	29B	29C	29D	29E				
30A	30B	30C						
31A								
32A	32B	32C	32D	32E				
33A	33B							
34D								
35A	35B	35D	35E	35F	35H	35I	35J	
36A	36C	36D	36E	36F				
40C								
41A	41C	41D	41E	41F	41G	41H		

MOS 93j: ATC Radar Controller

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C 13D
14A 14B 14D 14E 14F
15A 15B 15C
16B 16C 16D 16G 16H
17A 17B
19D
25A 25B 25C 25D 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B 33C
34D
35B 35D 35E 35F 35H
36A 36C 36D 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 94b: Food Service Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08B 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C 15F 15H 15J
16B 16E 16F 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35B 35D 35E 35F 35H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 95b: Military Police

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C 04E
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09B 09C 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12G 12H
13A 13B 13C
14A 14B 14D 14E 14F 14G
15A 15B 15C 15G
16B 16C 16D 16E 16G 16H
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F 27G
28A 28B 28C 28D
29A 29B 29C 29D 29E 29F
30A
32A 32B 32C 32D 32E
33A 33B 33C
34A 34C 34D
35A 35B 35D 35E 35F 35H 35I 35J
36A 36C 36D 36E 36F 36G 36H
40C
41A 41C 41D 41E 41F 41G 41H

MOS 95c: Correctional Specialist

01A 01B 01C 01D 01E 01F 01G 01H 01I
02A 02B 02C 02D 02E 02F 02G
03A 03B
04A 04B 04C
05A 05B 05C 05D 05E 05F 05G 05H 05I
06A 06B 06C 06D
07A 07B 07C 07E
08A 08C 08D 08E
09A 09D
10A
11A 11B
12A 12B 12C 12D 12E 12F 12H
13A 13B 13C
14A 14B 14D 14F
15A 15B 15C
16B 16G
17A 17B
25A 25B 25C 25D 25E 25F
26A 26C 26D 26E 26F
27B 27C 27D 27E 27F
28A 28B 28D
29A 29B 29C 29D 29E
30A
32A 32B 32C 32D 32E
33A 33B
34D
35A 35B 35D 35E 35F 35H 35I 35J
36C 36E 36F 36H
40C
41A 41C 41D 41E 41F 41G 41H

Appendix C: Sample Reports Generated by the Student Management System

This appendix contains samples of a TICCIT report and the JSEP Test Log Report Explanations for how to interpret these reports are also included.

CLASS COURSE/UNIT SUMMARY

COURSE: 099 SECTION: 00 UNIT:

Student Number	Student Name (Last, First)	Time H M	Lessons Passed	Lessons To Pass
228213354	B	21:35	25	04
212828687	D	00:29	00	29
579881471	E	13:27	16	13
800015112	F	33:26	16	13
228211462	H	19:53	14	15
229255668	I	52:24	29	00
227230938	J	02:40	01	28
225250174	K	27:31	29	00
228197535	L	34:23	24	05
013564621	M	32:25	29	00
577948366	N	47:33	21	08
411378554	O	31:10	29	01
226253240	P	40:53	23	06
578906252	Q	23:40	05	24
231257954	R	28:36	13	11
579869420	T	20:31	20	09
AVERAGES:		30:02	19	

The Class Course/Unit Summary Report provides information on the TOTAL time a student has spent on JSEP lessons, the total number of lessons passed, and the total number of lessons remaining. It also provides class averages for total time and lessons passed.

(The number of lessons to pass is not related to the number of lessons in a student's prescription, but rather to the number of lessons in JSEP.)

CLASS UNIT/LESSON STATUS

COURSE: 099 SECTION: 00

UNIT: 12 LESSON:

STUDENT NUMBER	STUDENT NAME (LAST, FIRST)	TIME H M	ATT # SCORE	COLOR
228213354	B	00:00	0	GREEN
212828687	D	00:00	0	BLACK
579881471	E	00:05	0	YELLOW
800015112	F	00:02	0	YELLOW
228211462	H	00:00	0	YELLOW
229255668	I	00:01	0	GREEN
227230930	J	00:00	0	BLACK
225250174	K	00:00	0	GREEN
228197535	L	00:07	0	GREEN
013564621	M	00:01	0	GREEN
577948366	N	00:13	0	YELLOW
411378554	O	00:01	0	GREEN
226253240	P	00:03	0	GREEN
578906252	Q	00:00	0	GREEN
231257954	R	00:00	0	GREEN
579869420	T	00:00	0	YELLOW
CLASS AVERAGE:		00:04	0	

The Class Unit/Lesson Status Report allows the instructor to examine data on the performance of all students in a particular lesson: The number of minutes spent on the lesson, the number of test attempts, scores on tests, and the color indicating pass, fail, incomplete, or not taken. Averages for times and attempts are also given.

Green -	Unit passed
Red -	Unit needs more work; unit test failed
Yellow -	Work on unit has been started but is not yetcomplete
Black -	Unit not started

INDIVIDUAL STUDENT UNIT/LESSON PROGRESS REPORT

NAME: Last, First ID: C/S: 050/90

LOCATION	DATES		TIME/AVG		TEST		SCORE		COLOR
UU.LL	START	END	H M	H M	ATT/AVG		ATT/AVG		
11.00			00:00	00:00	00	0.0	00	00	YELLOW
11.01	07/11/88	07/11/88	00:29	00:51	01	1.4	11	18	GREEN
11.02	07/13/88	07/13/88	00:46	00:40	01	1.3	09	15	GREEN
11.03	07/11/88	07/13/88	03:56	03:50	02	2.0	09	52	GREEN
11.04				01:33		1.7		21	BLACK
11.05				00:19		1.1		13	BLACK
11.06	07/11/88	07/11/88	00:00	00:16	01	1.2	10	15	GREEN
11.07	07/11/88	07/11/88	00:21	00:45	01	1.3	10	20	GREEN
11.08				00:20		1.0		09	BLACK
11.09				00:17		1.7		100	BLACK
11.16				00:02		2.5		79	BLACK
11.17				00:00		3.0		81	BLACK
UNIT TOTAL	07/11/88	07/13/88	05:40	08:53	1.2	1.3			

The Individual Student Unit/Lesson Progress Report lists information for a student and compares his or her performance to the class average. This sample page addresses all lessons in the 1 series (according to the JSEP-TICCIT correspondence table). Read across the third row. By looking at the Correspondence table we can see that 11.02 is equal to lesson 1b (Identify Units of Measure). This student STARTED and ENDED this lesson on 7/13/88. He took 46 minutes to complete the lesson while the average time spent on this lesson by the class was 40 minutes. He made one attempt (the average number of attempts is 1.3), and he achieved a SCORE of 9, compared to an average score of 15. The color green indicates he passed the lesson. Black=Not Taken; Red=Failed; and Yellow=Incomplete.

JSEP TEST LOG REPORT

Last Name, First Name ID#

PC	UNIT LESSON	NUMBER PARTS	STATUS	PART	TOTAL TAKEN	TOTAL CORRECT
1a	11.01	1	PASSED	1	13	11
1g	11.07	1	PASSED	1	13	10
1f	11.06	1	PASSED	1	12	10
1c	11.03	1	FAILED	1	11	07
1c	11.03	1	PASSED	1	11	09
1b	11.02	1	PASSED	1	10	09
2b	12.02	1	PASSED	1	10	10
2c	12.03	1	PASSED	1	10	10
2d	12.04	1	PASSED	1	09	08
2e	12.05	1	PASSED	1	16	15
2g	12.07	1	FAILED	1	09	06
2g	12.07	1	FAILED	1	09	07
2g	12.07	1	FAILED	1	09	07
12a	12.16	1	PASSED	1	10	10
12b	12.17	2	PASSED	1	02	02
				2	10	08
12c	12.18	2	PASSED	1	05	05
				2	05	05
12d	12.19	2	FAILED	1	05	00
				2	05	04
12d	12.19	2	FAILED	1	05	02
				2	05	05
12d	12.19	2	PASSED	1	05	05
				2	05	05

This sample shows the test results for each lesson an individual student has taken. Read across the row referring to Lesson 1a (Match Numerals with Word Names and Models). The UNIT LESSON column refers to the corresponding TICCIT code number (Lesson 1a = 11.01 in the table). The test for this lesson has 1 PART which the learner PASSED by getting 11 (TOTAL CORRECT) out of 13 (TOTAL TAKEN). Subsequent rows address each lesson for which the learner has completed the test one or more times.

Appendix D: JSEP Glossary

ADAPT	The TICCIT authoring system used to develop the JSEP courseware, as well as many other courseware programs.
ASCII	American Standard Code For Information Interchange. A common code understood by many computers.
ATTENTION FUNCTIONS	Group of special TICCIT student and instructor functions available by pressing the ATTENTION (ATT'N) key and a letter.
ATTENTION (ATT'N) KEY	In object mode, the ATT'N key is used for several functions including logging onto or off of the system or accessing the system calculator.
AUTHOR	In the TICCIT system: (Noun) A person who develops courseware and enters it into the system using the TICCIT authoring system. (Verb) To develop courseware.
BACKUP	(Noun) Copy of TICCIT disk data, stored on a medium such as magnetic tape, used to replace old data with updated materials or restore data lost through disk drive or system failure. (Verb) To produce a copy of disk data.
BATCH PROCESSOR	A TICCIT utility program that sequentially processes multiple files as a single job. In the TICCIT system, batch processors are used for courseware, graphics, and registration files.
BOARD	An electronic module that plugs into a computer or peripheral device and performs a specific function; also called a card.
BRANCH	To transfer control of an instruction to another part of a program. A command that specifies the location of the next display a student will see.
CARTRIDGE TAPE	Storage device for computer data, consisting of a rectangular protective container within which is a reel of magnetic tape and a take-up reel.
COAXIAL CABLE	Cable used for the high-speed transmission of data in a communications system.
COLD START	Activating the system from a fully powered-down state.
COMPUTER-BASED INSTRUCTION (CBI)	Use of a computer to provide instructional materials for a student. CBI features include immediate feedback to the student, self-paced instruction, and computer-managed instructional capabilities (CMI).
COMPUTER-MANAGED INSTRUCTION (CMI)	Use of the computer to assist the instructor in testing student comprehension and collecting and using information on student progress in course work.

COURSE-UNIT-LESSON SEGMENT (C.U.L.S)	In TICCIT, location specifier for a course file. Courseware may be authored at any of four levels within a course: course, unit, lesson, or segment. All courseware has a label that indicates its position in the course structure. For example, ED.1.6.1 identifies the first segment in the sixth lesson in the first unit of the JSEP civilian course called ED.
COURSEWARE	The instructional materials (software) in the form of computer programs that are presented to the student on a workstation monitor.
COURSEWARE RELEASE	Refers to updated JSEP materials released to JSEP sites periodically to provide new or revised lessons.
CPU	Central Processing Unit. The computer in the workstation.
CURSOR	A position indicator on the screen of a monitor, which moves in front of each character as it is entered from the keyboard.
DISK OPERATING SYSTEM (DOS)	An operating system that runs on many computers used in MicroTICCIT systems.
DUMP	(1) To transfer data to a peripheral device, such as a magnetic tape drive or printer. (2) To create a DUMP file using the TICCIT CLI or MPOS File I/O utility program.
DUMP FILE	A file containing one or more disk files created with the DUMP command and stored on a disk drive, magnetic tape, or a printout.
END-OF-MESSAGE CODE	TICCIT code associated with keys on the right keypad of a TICCIT keyboard, plus the NOTE key.
FLOPPY DISKETTE	A flexible magnetic disk, usually 5-1/4 or 3-1/2 inches in diameter, used for storage of small quantities of computer data. Floppy diskettes are removable.
FLOPPY DISK DRIVE	The drive in a computer into which a diskette is inserted.
HOST WORKSTATION	In the MicroTICCIT system, the workstation containing the coprocessor board and the large hard disk drive and often a printer. This workstation must be a PC/AT type computer or larger. It should be used only by the instructor.
HUB	In the MicroTICCIT system configuration, a device used to connect workstations to the Local Area Network, permitting communication with the host workstation and other workstations. Hubs are available with various numbers of ports.
INDICATOR	Device that indicates some condition of a unit, such as a light that indicates that a piece of equipment is operating.
LIGHT PEN	Hand-held light activated stylus, connected to the TICCIT workstation; used to mark screen positions or select options.
LOAD	To transfer materials from a magnetic tape to a hard disk.

LOCAL AREA NETWORK (LAN)	Set of hubs, boards, and cables by which the host workstation communicates with the other workstations and vice versa.
LOCAL AREA NETWORK (LAN) INTERFACE	Board installed in each computer in the MicroTICCIT system configuration to establish communication between the host and each workstation.
LOG OFF	To enter the necessary information to stop communicating with TICCIT programs.
LOG ON	To enter the information, such as an identification number and password, required to begin communicating with programs under TICCIT.
LOGGING TAPE	Magnetic tape used to store detailed information about students, responses, including each key stroke and the latency between the strokes.
MAGNETIC TAPE	Plastic tape coated with magnetic material, approximately one half inch in width and of various lengths, used to store software data. The tapes may be enclosed in cartridges or on large reels.
MAGNETIC TAPE DRIVE	Device in the host computer that reads and writes data on magnetic tape.
MENU	Screen display that offers a list of options for accessing other displays in the system.
MicroTICCIT SYSTEM	A TICCIT system configuration in which the host and the workstations are one of several brands of microcomputers. MicroTICCIT systems run TICCIT software programs.
MAILBOX	In the TICCIT system, a feature that allows users to send messages to each other through their workstations.
MONITOR	Component of the workstation on which displays are viewed by the system user.
OBJECT COURSEWARE	TICCIT courseware that is in the form a student will see.
OBJECT GRAPHICS	TICCIT graphics that are in the form a student will see. It is made from source code that has been processed.
OBJECT MODE	The TICCIT form of an ADAPT file when the student is using the file. In object mode, displays are presented, questions are posed, and responses are analyzed.
OFF-LINE	(1) Referring to programs that run under DOS rather than TICCIT; (2) Instruction that is not on the computer, such as workbook materials.
OPERATING SYSTEM	Collection of programs that provide an environment in which application programs can run, schedule and allocate resources, support multiple programs or tasks, prevent illegal user actions, and maintain logical disk structures.

OPERATOR	TICCIT person who performs the activities needed for daily operation of a computer system, such as bringing up and taking down the system, loading new software, performing backups, and archiving programs.
PASSWORD	A code associated with a user that the user must enter to have access to various parts of the TICCIT and JSEP systems.
PERIPHERAL DEVICE	Device used for input/output operations with the computer. Such devices include tape devices, terminals, and printers.
PERMANENT DATA AREA (PDA)	In the TICCIT system, a disk file that contains information about a student's activity in a course.
POWER-UP	To turn on the electrical power in a computer, or a component of a computer system, in order to bring up the system.
POWER-DOWN	To turn off the electrical power in a computer, or a component of a computer system.
PRINTER	An output device that translates electronic signals from the computer into paper copy.
PRINTOUT	Computer output printed on paper.
PROCESSOR	In ADAPT, a program that translates the author's programmed instructions (source) into deliverable courseware (object). Processing is the link between source mode and object mode.
PROCTOR	The JSEP person responsible for monitoring the classroom and assisting students if they have problems using the system.
PROCTOR FUNCTIONS	In the TICCIT system, functions accessed by pressing the ATT'N key and typing "p" and another letter. Proctor functions allow proctors or instructors to manage student progress in courseware and assist authors in debugging courseware.
PROCESS GRAPHICS	Option in the GRAPHIC FILE menu that is used to process a TICCIT source graphic into an object graphic for display by TICCIT.
REGISTRATION	In the TICCIT system, the process of creating a Permanent Data Area (PDA) for a user and allowing the user to access a course or courses on the system.
RESPONSE BOX	On a JSEP or a TICCIT display, a box in which a user may type information or use the light pen to indicate a response to be processed by the system.
SHUTDOWN	In the TICCIT system, refers to the menu for shutting down the system, or describes a system condition.
SOFTWARE RELEASE	In the TICCIT system, refers to the updated software released to TICCIT customers periodically to provide new system capabilities.

SOURCE COURSEWARE	In ADAPT, courseware that is in the form authors see displayed in a courseware editor.
SOURCE FILE	In ADAPT, file containing one or more pages of source courseware.
SOURCE GRAPHICS	TICCIT graphics that are in the form authors see while creating or editing graphics using the Graphics Editor.
SOURCE MODE	The state of an ADAPT file when a TICCIT author is creating or editing the file. New source files and changes to existing source files do not appear in object mode until they are processed.
STUDENT MANAGEMENT SYSTEM (SMS)	The JSEP specific management system that enhances the TICCIT management system (CMI).
STUDENT WORKSTATION	In the TICCIT system configuration, a workstation of the PC/XT or PC/AT type used by students to learn instructional materials. For JSEP, the workstation comprises a CPU, a monitor, a key board, and a light pen.
TICCIT	Time-Shared Interactive Computer-Controlled Information Television. The umbrella term for the CBI system proprietary to Ford Aerospace Corporation, encompassing all variations and configurations.
TOUCH SCREEN	Touch-sensitive screen on a monitor that is used to mark screen positions or select options.
WINCHESTER DISK	A storage device either internal or external to the CPU that can store large quantities of data; a hard disk.
WORKSTATION	In JSEP, a workstation consists of a monitor, TICCIT keyboard, touch device, such as light pen or touch screen, and a computer. TICCIT users, such as students, authors, instructors, and operators, interact with the TICCIT system at the workstation.

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VOLUME V

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JSEP PILOT TEST REPORT

CENTER FOR
EDUCATIONAL
TECHNOLOGY
FLORIDA STATE UNIVERSITY

Ford
FORD AEROSPACE CORPORATION

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INTRODUCTION

This report describes a demonstration of the Job Skills Education Program, conducted under Contract Number VN88003501 with the United States Department of Education.

The Job Skills Education Program (JSEP) is a computer-based curriculum of job-related lessons designed to teach academic skills that support vocational training. Originally developed for the U.S. Army, it has been adapted for use by civilian programs that serve adult learners. The project objectives were: 1) To ascertain if the JSEP could be successfully employed with civilian learners, and 2) To determine the minimum level of revision ("degreening") required to achieve a successful military-to-civilian transfer.

After the development of a civilian version of the JSEP a six- month pilot test was conducted at the White Plains, New York Adult and Continuing Education Center (Rochambeau School). The Pilot Test was not an experiment. Rather, it was a test of an educational program in a real, functioning school setting. Thus, the analyses presented in this report are based on operations data, not experimental data.

The White Plains Center was selected as the pilot test site because it has a heterogeneous audience of adult students, an effective faculty and administration, and the strong interest of the New York Education Department.

The Rochambeau School serves about 6,800 adults at any one time. The three major tracks in operation are Adult Basic Education (ABE), High-school Graduate Equivalency Diploma (GED), and English as a Second Language (ESL). The school operates with great flexibility to accommodate the varied schedules and differential progress rates of its adult students, who are promoted according to achievement rather than the academic calendar. Typically, about 3,900 (about 56%) of the students score below the ninth grade education level. Some 500 (about 7%) function between the ninth and twelfth grade levels. Another 2,400 or so (about 35%) are ESL students. The school's demographic information for 1987-88 indicated only 208 of the students were employed.

WHAT IS JSEP?

The JSEP is a curriculum of 167 lesson titles designed to teach adults the basic academic skills they require to succeed in job training. The lessons address basic quantitative and verbal skills, and are supplemented by a series of five Learner Strategy modules that teach students how to learn. Twenty-five of the lessons are paper-based. The JSEP lessons are controlled by the Student Management System (SMS), a system that tracks progress through individual student prescriptions. Student progress is self-paced, and student participation is on an open-entry, open-exit basis.

The JSEP was first developed for the United States Army by the team of Florida State University and Ford Aerospace Corporation, and was based upon an extensive job analysis of 94 military occupations. The current version of JSEP was adapted for civilian use: Lessons were "degreened", i.e. language, graphics, and examples were changed from Army content to appeal to and be understood by civilian adults; Lesson topics that were Army specific were dropped from the curriculum; and, Lesson prescriptions that are appropriate to civilian occupations were created.

The JSEP operates on the MicroTICCIT computer system. A typical MicroTICCIT system configuration consists of an IBM AT-style (Intel 80286 chip) host with a 338 megabyte hard disk networked with AT 80286 workstations. The stations are equipped with a special MicroTICCIT keyboard (or use a template over a standard keyboard) and peripheral light pen. The host is equipped with a printer. The MicroTICCIT software operates in MSDOS.

METHOD

Intact classes of students were selected for participation in JSEP, representing the regular distribution of ABE, GED, and ESL classes in the school. Individual classes were scheduled for two-hour periods in the JSEP lab.

Two JSEP instructors and an instructor's aide were selected from among the school's experienced faculty. The lead instructor had previous computer experience; the other two were novice computer users. Ford

Aerospace provided the two MicroTICCIT systems that would be used in White Plains, and trained instructors in systems operation in a week-long session at the Ford facility in Reston, Virginia. After the systems were installed at the Rochambeau School, Florida State University conducted a three-day JSEP Instructor Training session on site for the two instructors, the aide, and an administrator.

Measurement Instruments

The data collection activities in the Pilot were intended for both revision and evaluation purposes. The tests and questionnaires employed in the Pilot were primarily for the purpose of evaluation, so that we could describe the use of the JSEP with civilians and the resultant effects. These instruments are described below.

Each JSEP lesson contains a lesson posttest component that is referenced to the lesson objectives. The Student Management System (SMS) is based on a mastery approach; students who do not initially meet the passing criterion for a lesson posttest are given further instruction and are subsequently recycled through the lesson and posttest. The system default allows three attempts on a lesson posttest, after which instructor intervention is mandatory.

The combination of a mastery design and criterion referenced testing does not lend itself to meaningful comparisons of test scores across students or groups except in terms of absolute numbers of lessons passed, and average or actual numbers of attempts required. In JSEP no two students would be likely to take the same lesson path. This is true because each occupation has a different prescription and each student enters with a different set of skills. However, it is this latter type of information (i.e. number of lessons passed, number of attempts required to pass, and averages based on these), coupled with such measures as average time required to complete a lesson, that offers a valuable indication of overall progress.

The JSEP Common Test is a 65-item instrument that is criterion-referenced to a sample of lessons in the curriculum. It was adapted from the JSEP Test II, a 195-item instrument developed for the Army. The items for the Common Test were selected from the Army test on the basis of item analysis results, greenness considerations, and representativeness of the curriculum.

The motivation for shortening the new test, as compared to its Army predecessor, was to produce an instrument that the civilian target audience could complete in one hour or less, although the test is not speeded. The item format is multiple choice, with responses recorded by the students on paper optical-scan bubble sheets; the same test form is used for both pre- and posttesting. The reliability coefficients (Kuder-Richardson Formula 20 method) were .93 for the pretest and .94 for the posttest.

The Test of Adult Basic Education (TABE) is an achievement battery designed for use with semi-literate adults. The instrument has three tests--reading, arithmetic, and language, of which the Rochambeau School uses the first two. The TABE scores are expressed in grade levels. Because of insufficient agreement for the validity, reliability, and appropriate norming

Figure 1: Gender distribution of Students for COMMON TEST Analysis (N=61)

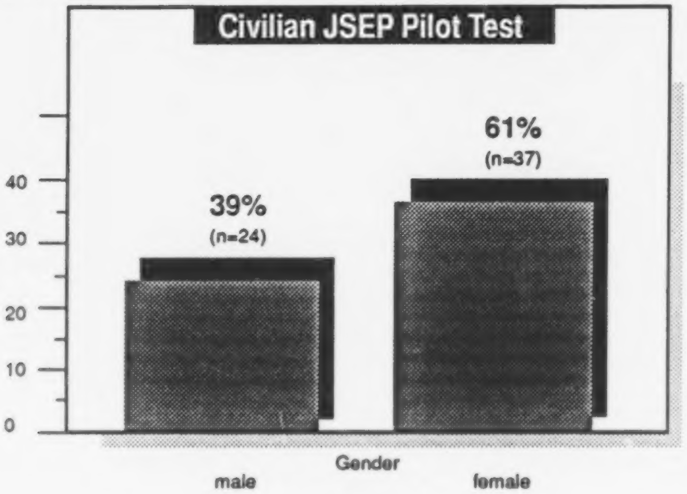


Figure 2: Age distribution of Students for COMMON TEST Analysis (N=61)

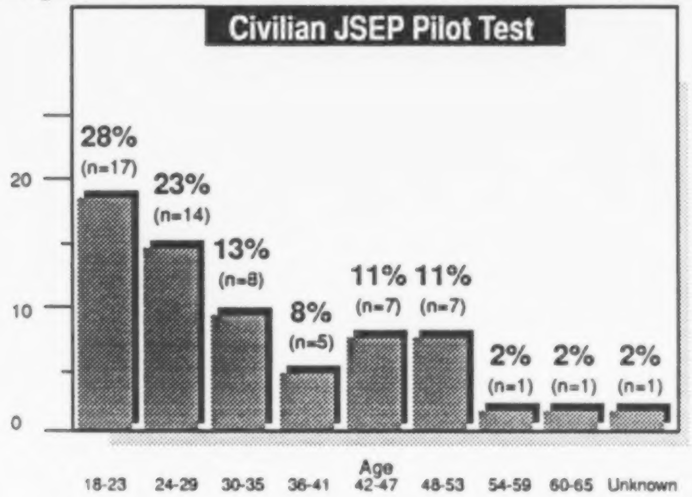
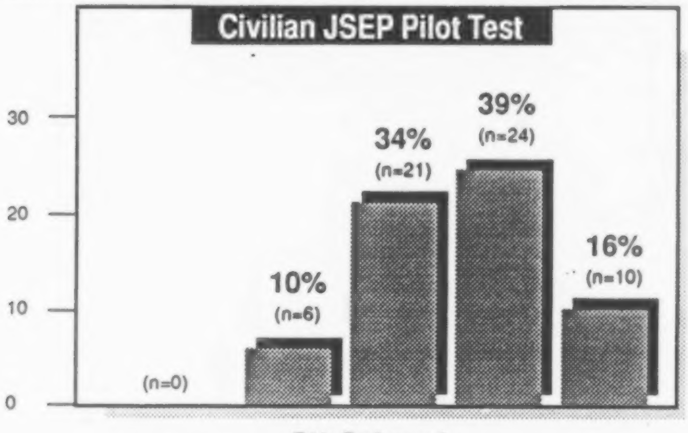


Figure 3: Ethnic background of Students for COMMON TEST Analysis (N=61)



(Percentages sum to 99% due to rounding) of the test, some psychometricians recommend that the TABE not be used for assessment of individuals, but allow its use as a pretest-posttest measure for groups. It is this latter use that was employed for the pilot test.

The Student Pre-JSEP Questionnaire consists of ten items related to computers, school, and the military. Students responded to these questions before beginning JSEP instruction.

The Post JSEP Questionnaire presents thirty-five items covering computer functioning, the JSEP curriculum, student motivation, reasons for taking JSEP lessons, and student satisfaction with JSEP. It was administered at the end of the instructional sequence.

The Lesson Reaction Questionnaire was used to collect information about the most recent lesson the respondents had completed. It contained ten items related to such issues as perceived lesson difficulty and reading level, and was weekly administered by the JSEP Instructor.

The tryout data collected during the pilot test was used to correct design problems and programming bugs in the curriculum, and will not be addressed further in this report.

Students in the Pilot Test

Of the 149 students who were enrolled and completed the pretest, 80 also completed the posttest. Most of the attrition (42%) was due to students securing work and leaving the school. Fifteen percent dropped out of school because of terminated financial support. Other reasons for not completing the program included returning to native country (6%), passing the GED and leaving school (7.5%), illness, transfer to another education program, marriage, and enlistment in the armed services. The reason for leaving is unknown for 19.6% of the students. The administration of the Rochambeau School reports that the retention rate of the students participating in the JSEP was much higher than the normal rate for the school.

Of the 80 students for whom we have both pretest and posttest scores:

- 11 (13%) scored 50 or higher on the 65-item pretest. Their strong pretest performance presented a restriction of the range of variance problem;

- 8 (9%) completed five or fewer lessons, and thus were considered to be inadequately exposed to the JSEP.

These cases were eliminated from further analysis, yielding an N of 61. The activities of all 149 students were considered in the analysis of the individual lesson posttests.

Figure 1 shows the gender distribution of the 61 students retained for the analysis of the Common Test results-- 37 (61%) were female and 24 (39%) were male. Figure 2 shows the age distribution for this group, and the ethnic background is shown in Figure 3.

Scores Selected for Use (Statistical Calculation)

Mean percentage gain is the mean raw score change (mean posttest score minus mean pretest score) divided by the mean pretest raw score, all on the Common Test.

Percentage Gain = (Post-Pre) / Pre x 100

With the Test of Adult Basic Education (TABE), we have reported mean gain in terms of grade levels rather than as a percentage.

The **standard deviation** (SD) is referenced to the raw score mean.

Effect size is an estimate of the magnitude of difference between two means, in this case the pretest and posttest raw score means, and is expressed in terms of the SD. It is derived by dividing the mean raw score change (raw score posttest minus raw score pretest) by the standard deviation of the pretest scores.

Effect Size = (Posttest mean - Pretest mean) / SD Pretest

Generally, an effect size of .3 SD is considered moderate, and an effect size of .7 SD is quite large. Effect size calculations provide a reasonable basis of comparison between otherwise dissimilar interventions.

PROCEDURE

The JSEP instructors enrolled the students in JSEP, creating student records and lesson prescriptions in the Student Management System. The

JSEP Common Test was administered as a pretest, along with the Pre-JSEP Questionnaire. The school administers the TABE to the ABE and GED students every term. The scores from the immediately prior administration were adopted as pretest scores.

One day a week the JSEP instructors administered the JSEP Lesson Reaction Questionnaire to everyone who finished a lesson that day.

The JSEP Common Test posttest and the Post JSEP Questionnaire were administered to students as they finished their lesson prescriptions, and to the rest of the students at the end of the pilot test.

The posttest version of the TABE was administered at the conclusion of the pilot test.

Throughout the pilot test the students worked at their own paces, and continued to participate in all of the other classes and normal activities in their individual programs at the Rochambeau School.

RESULTS

JSEP Common Test - Table 1 shows the summary results for the 61 students retained for analysis combining the ESL, ABE, and GED program participants.

Did the students learn from JSEP? Completing an average of 40.5 lessons in 78.8 hours, the students averaged a gain of 34% on the posttest from the pretest. The effect size of the improvement was a strong .97 SD. An analysis of variance showed no significant differences in the performance of the three subgroups (table 2).

What factors contributed to the final score? Table 3 shows that scores on the pretest were a significant predictor, with those scoring higher on the pretest also scoring higher on the posttest, with the correlation being .59.

A second contributor is the number of lessons completed, with those completing the most lessons making the highest scores, the correlation being .49 (Table 4).

The Pilot Test use of the TABE was deemed proper for several reasons, the two most important being that TABE was already in use at the Rochambeau School, and the U.S. Army uses the TABE and the scores of soldiers who have completed JSEP are available, allowing comparisons between that population and the civilian students.

Table 5 contains the results of the pre-JSEP and post-JSEP administrations of the TABE to the ABE and GED students; the TABE is not normally administered to ESL students. The scores on the TABE are expressed in terms of functioning grade level equivalents. The students had mean pre-JSEP reading and math scores of 6.8 and 6.7, respectively. (Among the soldiers who participated in the Army's evaluation of JSEP, the average reading score was at the 10.0 grade level and the average math score was 8.7.) The mean post-JSEP TABE scores were 8.0 for reading and 7.5 for math. The average gain scores were 1.26 grades for reading, .94

grade for math, with respective effect sizes of .68 and .50 SD. This is in the context of an average of 83.6 hours of JSEP instruction.

Because the Pilot was not an experiment most of the students participating in the JSEP also received other instruction during the normal classes at Rochambeau.

Table 1: Results from the JSEP Common TEST - Combined Scores

	ESL,ABE,GED
N	61
MEAN GAIN SCORE %	**34**
Mean Raw Gain Score	9.9
Pretest	
Mean Score %	45
Mean Raw Score	28.9
Posttest	
Mean Score %	60
Mean Raw Score	38.8
STANDARD DEVIATION	
Pretest	**10.2**
Posttest	**11.8**
EFFECT SIZE (SD)	**.970**
Mean Hours on Line	78.8
Mean Lessons Completed	40.5

Table 2: Analysis of Variance Summary for Posttest Scores as a Function of Group Membership (ABE, GED, ESL)

Source	df	SS	MS	F	P
Group	2	366.77	183.38	1.3	$\leq .27$
Error	58	800.17	137.93		

Variance explained (Multiple R^2) = .04

Table 3: Analysis of Covariance Summary for Posttest Scores with Covariates of Lessons Completed and Pretest Scores

Source	df	SS	MS	F	P
Lessons completed	10	1196.05	119.60	2.20	$\leq .03$
Pretest Score	1	1591.64	1591.65	29.36	$\leq .01$
Error	49	2655.77	54.19		

Variance explained (Multiple R^2) = .68

Table 4: Analysis of Covariance Summary for Posttest Scores with Covariates of Hours On Line and Pretest Scores

Source	df	SS	MS	F	P
Hours	7	475.97	67.99	1.04	$\leq .41$
Pretest Scores	1	4098.28	4098.28	63.12	$\leq .01$
Error	52	3375.85			

Table 5: Results from the TEST of ADULT BASIC EDUCATION for ABE, GED Combined (N=41)

	Grade Level Equivalent	
	Reading	Math
MEAN GAIN SCORE	**1.26**	**.94**
PRETEST		
Mean Score	6.85	6.77
STANDARD DEVIATION	**1.85**	**2.18**
Minimum Score	3.0	3.3
Maximum Score	10.1	12.9
POSTTEST		
Mean Score	8.09	7.52
STANDARD DEVIATION	**1.98**	**2.10**
Minimum Score	4.2	4.2
Maximum Score	12.9	12.9
EFFECT SIZE (SD)	**.681**	**.508**

Lesson Posttests

Analysis of individual lessons posttests provides information that is useful for revision efforts, a topic that is not a focus of this report. Lesson posttest information is also invaluable to the JSEP instructor in monitoring the progress of individual students. Because the SMS allows multiple attempts on individual lesson tests, group average scores are not as clearly meaningful as are scores on the Common Test. However, aggregate information from these tests, combined with average time in each lesson and the average number of attempts required, can permit conclusions about other data that might otherwise be impossible. The ABE, GED, and ESL students averaged virtually the same number of attempts per lesson.

JSEP QUESTIONNAIRE RESULTS

The responses to the Pre-JSEP Questionnaire are presented in table 6. One of the major concerns here was how students felt about the military or features within the lessons that represented the military. This was important information since the lesson adaptation process was not intended to remove all military artifacts, only those that might interfere with learning. Even then, these artifacts were deleted only to the point where it was judged that military content would not affect learning. Consequently, data such as the following provide indicators of how effectively and efficiently this goal was accomplished. For example, on the item "Seeing people in uniform makes me feel bad," 68% (94 out of 143) of the respondents did not find uniforms upsetting. Twenty percent (30 out of 143) felt that the sight of uniforms would bother them. The remaining 12% were uncertain (19 out of 143).

The responses to the Reaction Questionnaire are presented in table 8. This set of questions gave students an opportunity to comment on a specific lesson they had recently completed. Respondents reported that they could read the materials and that they understood the lesson objectives. Eighty-two percent (41 out of 50) replied that they understood the lesson they were working on when they were asked to complete the Reaction Questionnaire. Similarly, fifty-six percent (26 out of 50) felt that their particular lesson at an appropriate level of difficulty.

Concerning computer use, the respondents felt overwhelmingly that this skill was important to them. Ninety-eight (146 out of 149) percent of the respondents agreed with the statement "Knowing how to use a computer is important."An informative point of contrast emerged when one of the above items ("Seeing people in uniform makes me feel bad") was compared with two follow-up items on the Student Reaction Questionnaire: "I noticed military objects in this lesson," and "I noticed some people in uniform in this lesson." In both cases most of the respondents noticed residual military objects in the lessons. But on the first item, 32% (16 out of 49) responded that they did not notice the these objects, and 12% were uncertain. On the second item, 28% (13 out of 45) did not notice military objects in the lesson, and again, twelve percent were uncertain.

When all JSEP instructors were asked, "Did any student mention to you that he or she noticed military content or objected to it?," all instructors (N=5) responded "no." That time period covered more than 5000 student hours of JSEP instruction.

Responses to the Post-JSEP Questionnaire are presented in table 7. This section is broken down into five subheadings: computer functioning, the curriculum, student motivation, reasons for taking JSEP lessons, and student satisfaction with JSEP. Again, the figures represent selected results.

1. Computer functioning. The data show clear agreement that JSEP's technical features functioned as designed. Respondents agreed that JSEP:

• Had clear screen displays	97% (79 out of 81).*
• Was a well-managed program	88% (68 out of 79).
• Was easy to learn	85% (69 out of 81).*

2. Curriculum. In the area of instructional prescriptions, the respondents agreed that the instruction was relevant to their goals:

• Skills taught were job-related	79% (64 out of 81).*
• Instruction to testing ratio correct	75% (59 out of 79).

3. Motivation. Most of the responses indicated high levels of student motivation. Respondents said that they:

• Wanted to learn	87% (71 out of 81).*
• Wanted more JSEP instruction	82% (65 out of 79).
• Did not get tired	77% (63 out of 81).*
• Did not get bored	66% (53 out of 80).

4. Reasons for taking JSEP lessons. Respondents offered these personal reasons for enrolling in JSEP:

• Help get GED	86% (68 out of 79).
• Self-improvement	86% (68 out of 78).
• Get a better job	66% (50 out of 76).

5. Satisfaction with JSEP. Responses showed that respondents liked their experience with JSEP and computer-based instruction. The respondents indicated that they:

• Felt JSEP would help in understanding technical information	87% (71 out of 81).*
• Would recommend JSEP to others	81% (64 out of 79).
• Liked JSEP after using it	76% (59 out of 78).
• Enjoyed math and reading because lessons were job related	71% (56 out of 79).
• Felt lessons would help on the job	71% (57 out of 76).

*NOTE: **One student completed the post-JSEP measures but did not complete the pre-JSEP measures. While this student's scores were not used with pre- post- comparisons, questionaire responses have been retained, increasing the response base by one.**

Time Apparently On Task. Relevant time-on-task is known to be a significant contributor to learning and performance. It is also one of the more difficult variables to measure. In this study we chose unobtrusive measures that are defined as "apparent time on task."

Snapshots were taken in the JSEP Center and examined for the number of students watching the screen. These revealed a high degree of student attention to the screen.

Visitors and observers asked often if the JSEP Center is ..."always this busy and quiet." Instructors reported that students consistently worked hard and were reluctant to relinquish their seats when it was time to change classes.

DISCUSSION

Conclusions. In addition to the student performance and preference data, the administrators and instructors at White Plains have frequently described their enthusiastic satisfaction with JSEP to visitors.

Based on results at another JSEP site in Meridian, MS, not a part of this pilot test, the user-group plans expansion to five additional sites.

Student performance in JSEP appears to be excellent, based on the effect sizes of learning gains.

Student reaction to JSEP is predominantly positive.

The data from the Pre-JSEP and the Reaction questionnaires support the following conclusions:

1) The students understood what they were supposed to do in the lessons.
2) The students could read the materials.
3) The lesson content was at about the right level of difficulty.
4) The presence of objects, processes, and references related to the military did not seem to affect student performance adversely.
5) Students perceived the opportunity to use a computer as a positive and valuable part of JSEP instruction.

The results from the student performances on the individual lesson posttests, the JSEP Common Test, and the TABE indicate that these civilian adults were able to succeed in and learn from the JSEP curriculum. Each of the three main subgroups posted very impressive gains and evidenced continued enthusiasm for studying in the program.

Table 6: Student responses to PRE-JSEP QUESTIONNAIRE

Percentage

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
1.	Knowing how to use a computer is important.	60	37	1	1	-	99%
2.	The subjects taught in school are important.	68	31	-	1	-	100%
3.	I like studying in school.	58	41	1	-	-	100%
4.	I would like to know how to use a computer.	67	31	1	1	-	100%
5.	Studying at the center will help me get a job later.	54	38	5	1	1	99%
6.	Seeing people in uniforms makes me feel bad.	6	15	13	46	19	99%
		Yes	No				
7.	I have a high school diploma.	40	59	-	-	-	99%
		58	84	-	-	-	142
8.	I have been in the military before.	5	95	-	-	-	100%
		7	138	-	-	-	145
9.	I have used a word processor before.	11	89	-	-	-	100%
		16	129	-	-	-	145
10.	Some of my friends know how to use computers.	72	28	-	-	-	100%
		103	41	-	-	-	144

(Not all percentages sum to 100 due to rounding.)

Table 7: Student responses to POST-JSEP QUESTIONNAIRE

Percentage

Number

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
1.	Learning to use the computer was easy.	19	67	6	7	1	100%
		15	54	5	6	1	81*
2.	The JSEP computer program was well-managed.	21	63	13	-	3	100%
		16	49	10	-	2	77
3.	The JSEP computer program ran without any problems.	14	49	19	17	1	100%
		11	39	15	14	1	80
4.	I think all students should study JSEP lessons in their educational programs.	41	44	9	4	2	100%
		33	35	7	3	2	80
5.	The monitor screen displays were clear.	36	62	1	-	1	100%
		29	50	1	-	1	81*
6.	I think the classroom instructor should teach more lessons than the computer.	10	24	39	25	1	99%
		8	19	31	20	1	79
7.	I think computer lessons should only be used to practice what we learn from an instructor.	5	23	20	41	11	100%
		4	18	16	33	9	80
8.	I think we should use written assignments along with the computer lessons.	15	46	20	14	5	100%
		12	37	16	11	4	80
9.	The lessons I studied will help me on the job.	21	50	19	6	4	100%
		17	40	15	5	3	80
10.	JSEP lessons will help me read information in technical manuals better.	34	56	6	-	4	100%
		27	45	5	-	3	80
11.	JSEP lessons will help me understand technical information better.	28	59	11	-	1	99%
		23	48	9	-	1	81*

Table 7: (Continued)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
12. The skills I've learned in JSEP will help me move ahead in my job.	20	59	19	1	1	100%
	16	48	15	1	1	81
13. I think the computer should present more lessons than the instructor.	11	31	34	21	3	100%
	9	25	27	17	2	80
14. There is too much testing and not enough learning in JSEP.	6	10	9	65	10	100%
	5	8	7	51	8	79
15. I feel more confident about learning additional material because of JSEP.	24	50	21	4	1	100%
	19	40	17	3	1	80
16. Computer lessons should definitely replace regular classroom instruction in basic skills.	10	21	32	32	5	100%
	8	17	26	26	4	81
17. It was easier for me to learn material from the computer than from an instructor and a textbook.	11	34	32	19	4	100%
	9	27	26	15	3	80
18. I would like more variety in computer presentation such as games or simulations.	6	43	19	30	1	99%
	5	33	15	23	1	77
19. I would like to take more JSEP lessons in the future.	27	56	11	5	1	100%
	21	44	9	4	1	79
20. I would like to take more JSEP lessons if they were offered at a different time.	16	37	32	14	1	100%
	13	29	25	11	1	79
21. I enjoyed learning math and reading skills because the lessons were job related.	23	48	18	9	2	100%
	18	38	14	7	2	79

Table 7: (Continued)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
22. Lessons should include subjects like buying life insurance, balancing check books, and completing tax forms.	19	41	25	14	1	100%
	15	33	20	12	1	81
23. I got bored with JSEP lessons after a while.	1	19	14	51	15	100%
	1	15	11	41	12	80
24. The computer lessons made me tired.	-	12	12	58	17	99%
	-	10	10	47	14	81
25. I wanted to learn from the computer lessons.	28	59	8	2	2	99%
	23	48	6	2	2	81
26. My motivation to learn from the computer lessons stayed at the same level.	8	24	21	34	13	100%
	6	19	16	27	10	78
27. I got tired of using the computer.	-	5	17	59	19	100%
	-	4	14	48	15	81
28. I would recommend JSEP to persons who wanted to improve their job performance.	30	51	14	4	1	100%
	24	40	11	3	1	79
29. I took JSEP lessons for self-improvement.	20	66	11	3	-	100%
	16	52	9	2	-	79
30. I took JSEP lessons for general knowledge.	28	57	11	4	-	100%
	21	43	8	3	-	75
31. I took JSEP lessons to get better at my job.	24	42	22	11	1	100%
	18	32	17	8	1	76
32. I took JSEP lessons to help me get a GED certificate.	30	56	6	4	4	100%
	24	44	5	3	3	79

Table 7: (Continued)

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
33.	I liked JSEP better after I used it for a while.	21	55	15	9	-	100%
		16	43	12	7	-	78
34.	Making mistakes in private is better than having the instructor see them.	5	25	16	43	11	100%
		4	19	12	33	9	77
35.	I think computer lessons help me learn about computers.	29	48	14	5	4	100%
		22	37	11	4	3	77

(Not all percentages sum to 100 due to rounding.)

***NOTE: One student completed the post- JSEP measures but did not complete the pre-JSEP measures. While this students scores were not used with pre- post- comparisons, questionnaire responses have been retained, increasing the response base by one.**

Table 8: Student responses to LESSON REACTION QUESTIONNAIRE

Percentage

Number

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Total
1.	This lesson was too hard for me.	6	20	18	52	4	100%
		3	10	9	26	2	50
2.	This lesson will help me in my skills training program.	44	44	12	-	-	100%
		23	23	6	-	-	52
3.	I understood this lesson.	34	48	12	6	-	100%
		17	24	6	3	-	50
4.	This lesson was too easy for me.	-	18	24	48	10	100%
		-	9	12	24	5	50
5.	I noticed military objects in this lesson.	12	43	12	29	4	100%
		6	21	6	14	2	49
6.	This lesson was difficult to read.	5	10	8	65	12	100%
		3	5	4	34	6	52
7.	I noticed some people in uniform in this lesson.	8	49	13	27	2	99%
		4	22	6	12	1	45
8.	The military objects and uniforms in this lesson distracted me.	-	7	20	63	10	100%
		-	3	9	29	5	46
9.	The words in this lesson were difficult to read.	-	9	14	66	11	100%
		-	4	6	29	5	44
10.	The objectives in this lesson were clear.	33	60	4	-	2	99%
		15	27	2	-	1	45

(Not all percentages sum to 100 due to rounding.)

Recommendations

Additional degreening. While the students indicated that the "residual greenness" from the curriculum's Army origins was not distracting, the JSEP instructors felt that all Army presence should be removed. It is unlikely that further effort to this end would produce gains in student performance. However, this issue may influence public acceptance of the program, thus, may indeed be worth the additional adaptation effort. This matter should be discussed further.

Expanded curriculum. Students, JSEP instructors, and potential users who have observed the pilot test have all expressed a desire for an expanded JSEP curriculum. Some want new skills added to the curriculum. Others want the current topic base expanded downward to allow participation by students at more elementary skill levels. Discussion has been devoted to the creation of a core of "life skills" that address social survival issues rather than academic skills. The creation of a "JSEP Users Group" to coordinate these requests and facilitate further curriculum development could keep future efforts from being dissipated and wasted.

Retention. The administration of the Rochambeau School reported that their retention rate of JSEP students was higher than average. This phenomenon should be examined so that other users can take full advantage of it. It is possible that it may be accompanied by an increase in recruitment of new students by current students. Retention is very important to school funding, and the reduced attrition rate associated with the JSEP Pilot Test merits investigation.

JSEP as prevention. By the junior and senior years of high school most students are clearly on a path to college enrollment or to work/vocational training. Some observers of JSEP have suggested that the program be implemented in high schools to prepare those students who will be pursuing vocational education, on-the-job training, or direct placement. This proposition should be investigated to determine how schools can work in concert with local employers and vocational training organizations to make use of the JSEP. This effort should also attempt to determine what changes, if any, are required in the JSEP curriculum and SMS in order to function smoothly in a high school setting.

Adding new occupations. Another logical application of JSEP is in the workplace. The United States is experiencing rapid technological change in industry and manufacturing, with the result that workers who are employed today must be retrained and "upgraded" in order to be able to perform their jobs tomorrow. Operational testing of JSEP in the workplace offers the opportunity to perfect techniques of matching tasks from specific jobs with lesson topics from the curriculum and of generating original lesson prescriptions for new vocational areas and titles.

On balance, we believe that the results of the Pilot Test demonstrate clearly that it is feasible to transfer selected programs from military to civilian use and use them effectively.

VOLUME VI

JSEP
FINAL DISSEMINATION PLAN

CENTER FOR
EDUCATIONAL
TECHNOLOGY
FLORIDA STATE UNIVERSITY

FORD AEROSPACE CORPORATION

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Appendix A 4

Product Availability

Florida State University (FSU) and the U.S. Government (represented by the Secretary of the Army) are in the process of negotiating a formal agreement that will allow distribution of the Job Skills Education Program (JSEP) through commercial channels. Potential JSEP users should contact Director, Center for Educational Technology, Florida State University, Tallahassee, FL 32306 for current information about JSEP courseware availability. Appendix A provides a list of current, published articles that describe various aspects of JSEP.

JSEP exists as computer-based courseware that runs on Ford Aerospace's (Ford) MicroTICCIT computer system. Consequently, hardware requirements, component availability, and costs are issues that users will have to discuss with Ford directly. These items are presented below under the headings Required Computer Capability and Implementation Costs.

Required Computer Capability

JSEP requires a combination of computer hardware and operating system software to function. Until recently, the required hardware and the operating system have been proprietary items available only from Ford. This was true even though JSEP courseware is written in ADAPT, a Ford proprietary language compatible with many DOS-based systems.

However, Ford now offers software products that 1) replace all proprietary MicroTICCIT hardware components (especially the 860A video display board), 2) allow standard PCs to function as workstations when connected to a host computer with a sufficiently large hard drive, and 3) allow MicroTICCIT system software to deliver courseware on a variety of hosts and fileservers.

Ford has also developed software that will allow standard PC's, the IBM PS/2 line of computers for example, to serve as student workstations. This product is scheduled for delivery in fall 1990. The result is that a potential user can buy and install these items independently or have Ford provide them as in past implementation procedures. A user choosing the first option will add a local area network board, a light pen board, and a keyboard template to an individual computer to complete a host-workstation system. A typical system configuration using currently available hardware and software consists of the following items:

1) Host computer. This component is an AT 80282, DOS-based computer running at 12 MHz, with 1 MB RAM, one 1.2 MB floppy disk drive, a 16 or 6 port hub, 1 async port, and 1 parallel port. Requirements for this computer include a hard drive large enough to load system software, courseware, and student data--at least 338 MB; a local area network (LAN) board and related software to communicate with the workstations; a coprocessor board to support mathematical operations; and an appropriate VGA card to permit using color monitor display. An appropriate printer of the user's choice supports system printing requirements.

2) Workstations. A standard, commercially available AT VGA-based computer such as the IBM PS/2 Model 50 can serve as a student workstation. Two additions are necessary to connect the workstation to the host system through a LAN. These are a commercially available LAN board and a light pen board with light pen. With the light pen students can interact with the courseware by touching the screen instead of using a keyboard. Finally, a MicroTICCIT keyboard overlay is necessary to identify MicroTICCIT-specific keys if the user chooses not to use the standard MicroTICCIT keyboard from Ford.

Required Instructor Preparation

Instructor preparation for JSEP requires two levels of training. However, the training itself neither assumes nor requires any previous computer training or experience. Consequently, one person may function in two capacities. The first level is System Operator training. This level is appropriate for the person responsible for bringing up the system in the morning and shutting it down at the end of the operating day. In addition, the System Operator is trained to generate and print out student reports as needed. Ford provides training at this level, as the System Operator procedures are specific to MicroTICCIT.

The second level of training is JSEP Instructor. At this level instructors are trained how to register students in JSEP, log students on and off the MicroTICCIT system, monitor students' progress through their prescriptions, and create custom prescriptions when necessary. The Center for Educational Technology (CET) provides this training. In practice, however, an organization achieves greater cost effectiveness by training personnel to carry out functions at both levels.

Appendix A

JSEP Articles and Presentations

Branson, R. K. (1990). Design, development, and technology transfer in the Job Skills Education Program. In T. Shlechter (Ed.), *Problems and promises of computer-based training*. Norwood, NJ: Ablex Publishing Corporation.

Branson, R. K. (in press). Technology in adult basic skills: The Job Skills Education Program. In A. Scales & J. Burley (Eds.), *Perspectives in adult literacy: Adult and continuing education*. Wm. C. Brown Publishing Co., Dubuque, IA.

Branson, R. K. (1989). *Design, Development, and Technology Transfer in the Job Skills Education Program*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Branson, R. K. (1988). *Transferring the Job Skills Education Program to the Civilian Community: Issues and Implications*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Wilson, L. "An On-Line Prescription for Basic Skills," *Training and Development Journal*. Alexandria. VA: American Society For Training and Developmental April 1990 pp. 36-41.

Wilson, L. "One Answer For Workplace Literacy Efforts: JSEP. *Online with Adult and Continuing Educators*. Washington DC: American Association for Adult and Continuing Education, February, 1989, pp. 4-5.

Wilson, L. "Workplace Literacy and the Job Skills Education Program," *Communicator*. Alexandria, VA: American Society For Training and Development. Spring, 1988, pp. 2-8.

Wilson, L. "The Job Skills Education Program: The Army's Largest Technology Transfer Program," *Attention!*. San Diego CA: Military Education and Training Special Interest Group of the American Educational Research Association, Winter. 1990. pp. 5-7.

Wilson, L. "Developing a Workplace Literacy Program." Paper delivered at the National Workplace Literacy Conference 1989, Rochester, NY, November 7, 1989.